

March 1999

The Business of Change

MP3 Spree
Chuck D
Rips the
Music Biz

The Other
Microsoft
Case

Assault and
Batteries
Electric
Dragsters
Suck Amps!

The Pleasure
Binge
Winning in the
Entertainment
Economy

PLUS:

The Pentium III
Lowdown

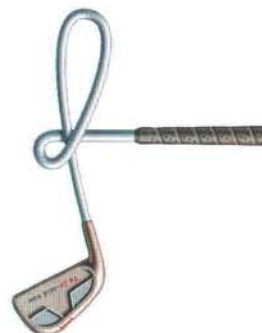
Actually Funny Jokes
from the Web

Jeff **Bezos** **Why Him** (and Not You)

The inside story of Amazon.com's boy billionaire



\$4.95 / Canada 5.95



Feel frustrated, angry and relaxed
is a good walk spoiled. A game of
plain drive you crazy. All the more
as comfortable as possible. The golf
are made with naturally breathable
of movement, and the shirt has an
So when your golf pro informs you
at a condemned playground," you'll



all at once. Golf, it has been said, expletives not deleted. It can just reason for us to make our golf clothes shirt and vest at right, for example, cotton, cut comfortably wide for ease extended tail that stays tucked in. I've seen better swings at least appear relaxed.



November 3, 1998, 3:06 a.m.

A Dell customer checks the status of her order at the company's Web site, and finds her answer immediately. Dell gets one happy customer.

Incidentally, 400,000 Dell customers check their orders at the company's Web site each month.



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of commerce solutions
in action:

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offers online shoppers
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and inventory status
on millions of books.

EddieBauer.com
features personal
wish lists, a reminder
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dates, and more
products than their
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Starbucks.com is a
new way for Starbucks
fans to experience
the coffee, company,
and culture of Starbucks.

Dell built its commerce solution on a Microsoft® platform of Windows NT® Server and the BackOffice® family, because the products scaled easily to meet its growing capacity needs and its \$2 billion in annual online sales. You, too, can quickly build a commerce solution on this scalable, flexible platform starting with many of the systems you already have, along with an industry of partners, to address your specific needs. To find the right partner who can best help you, or to get the free Digital Nervous System: Commerce Solutions CD, visit www.microsoft.com/dns

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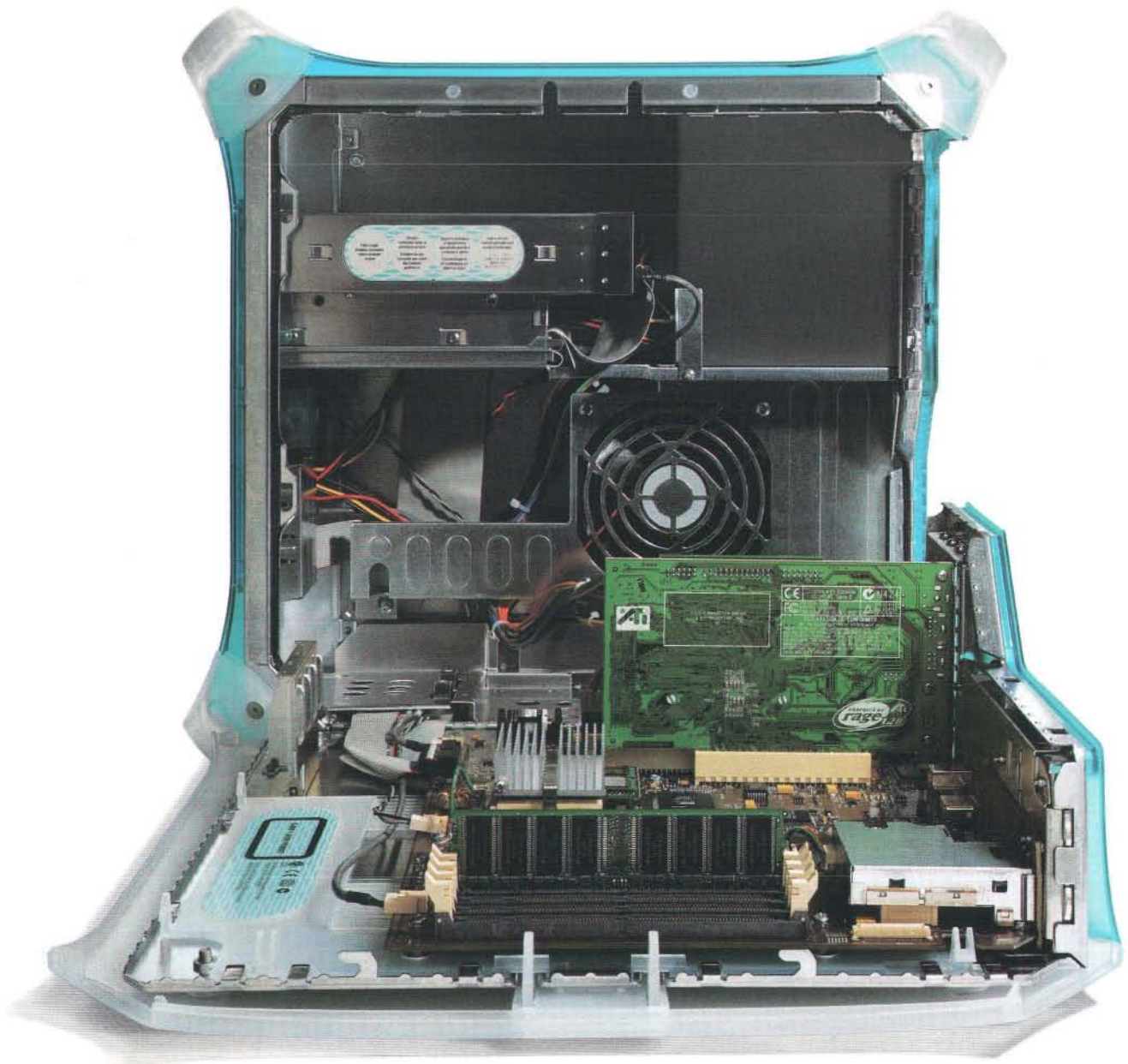
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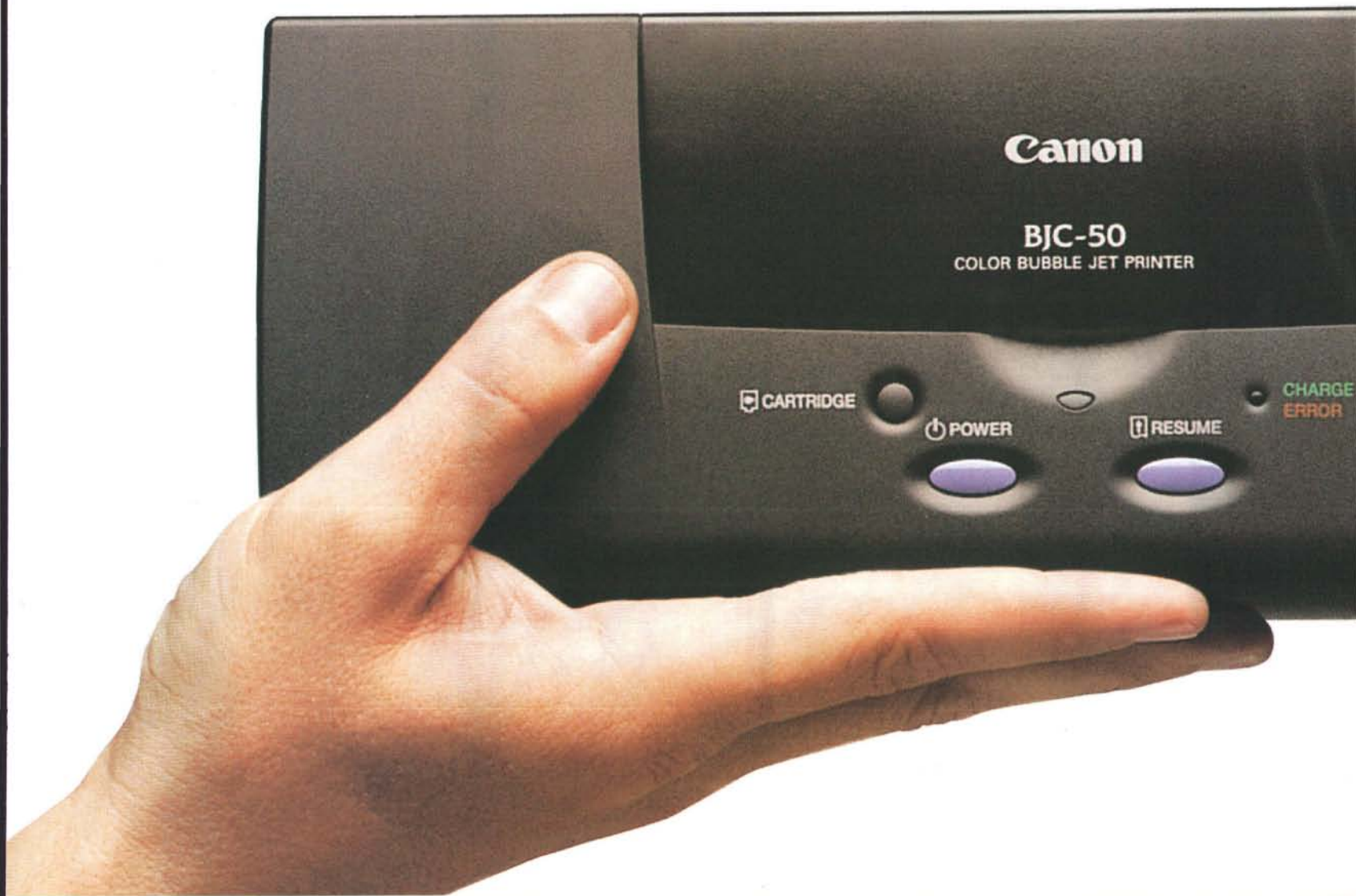
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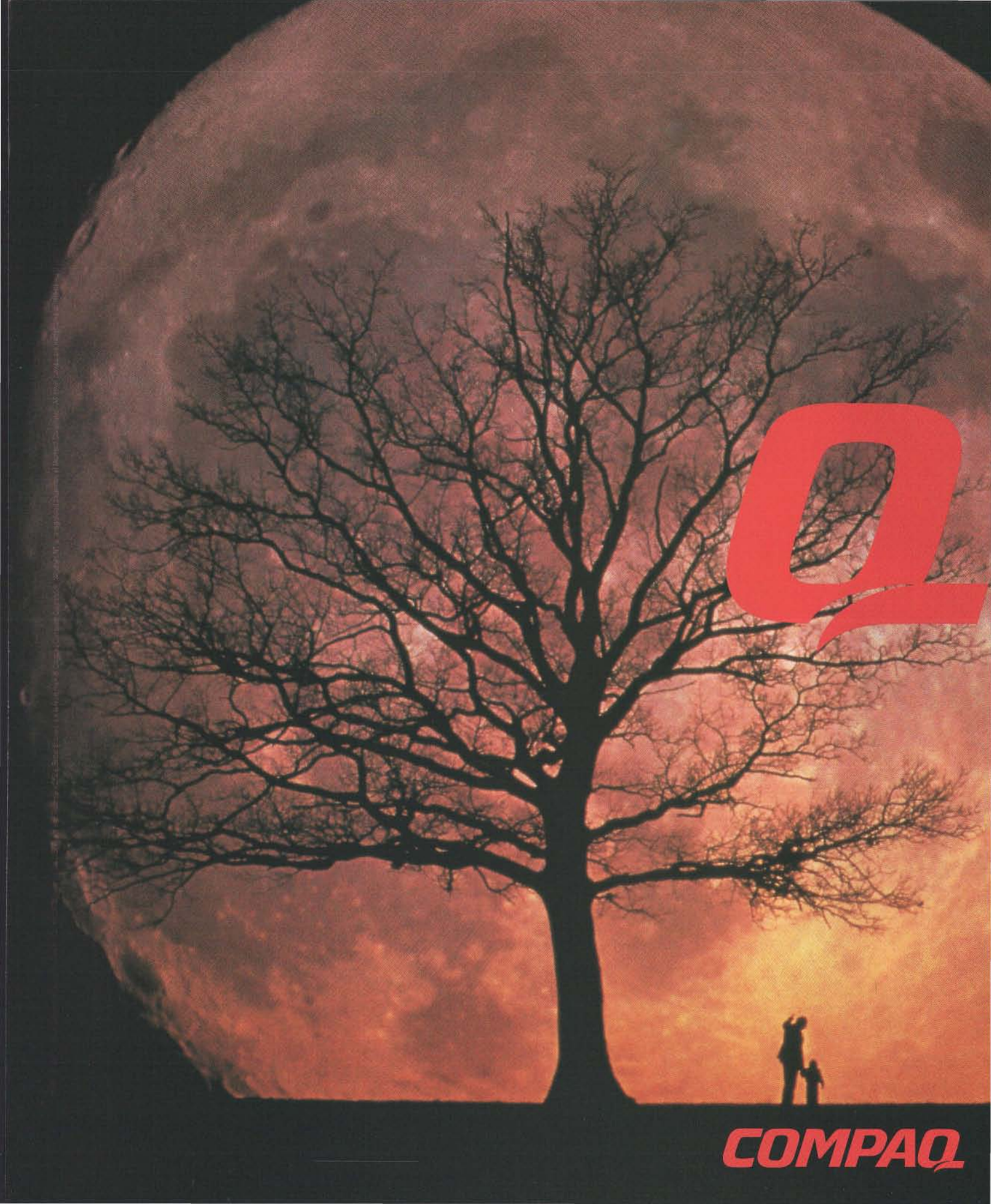


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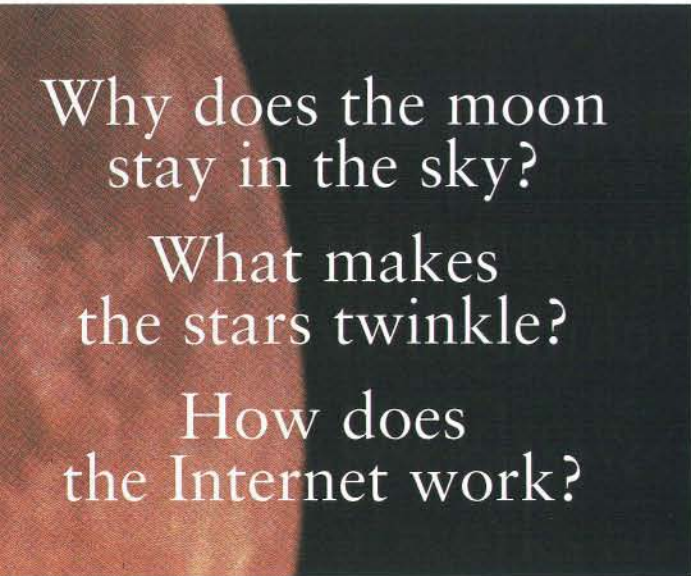
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A stylized graphic of Michael Jordan's number 23 jersey. The number '23' is formed by a grid of green and red squares, with a solid green '2' and a red '3'. The jersey is set against a background of a grey and white halftone pattern. The name 'michael jordan' is written in a bold, black, sans-serif font across the middle of the jersey.

michael jordan

Chuck D, page 138

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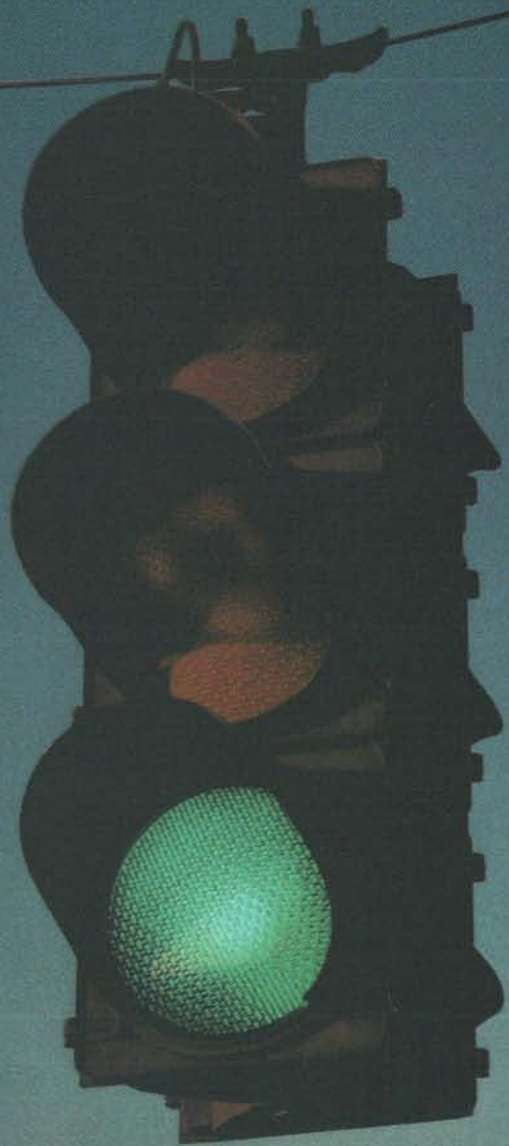
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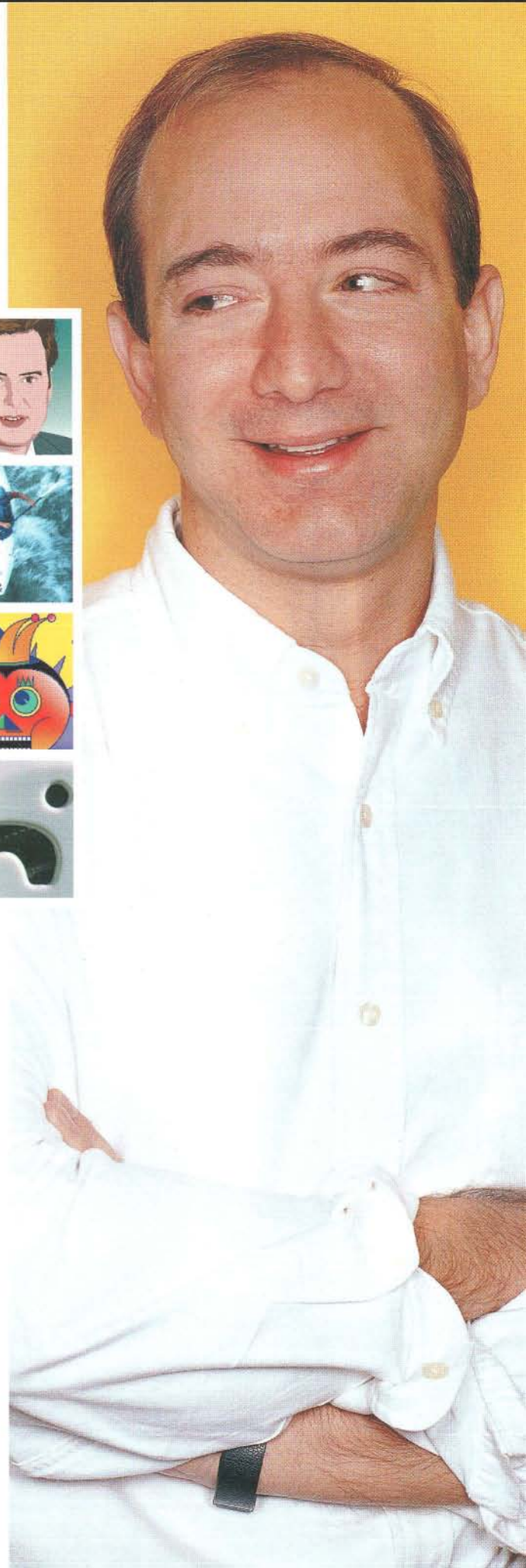
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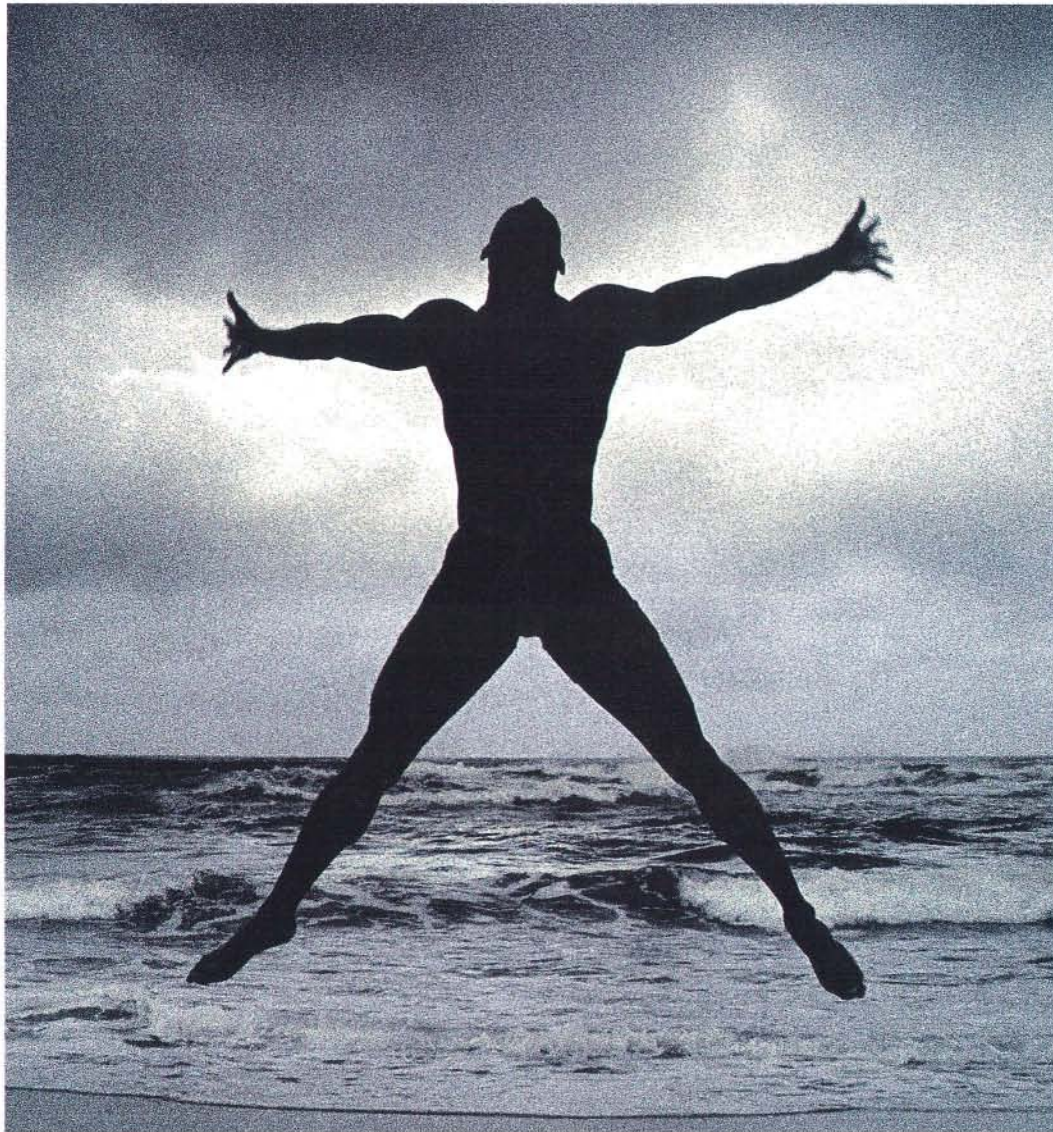
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*In a past life, I was Nostradamus.
Nothing, I mean nothing, surprises me.*

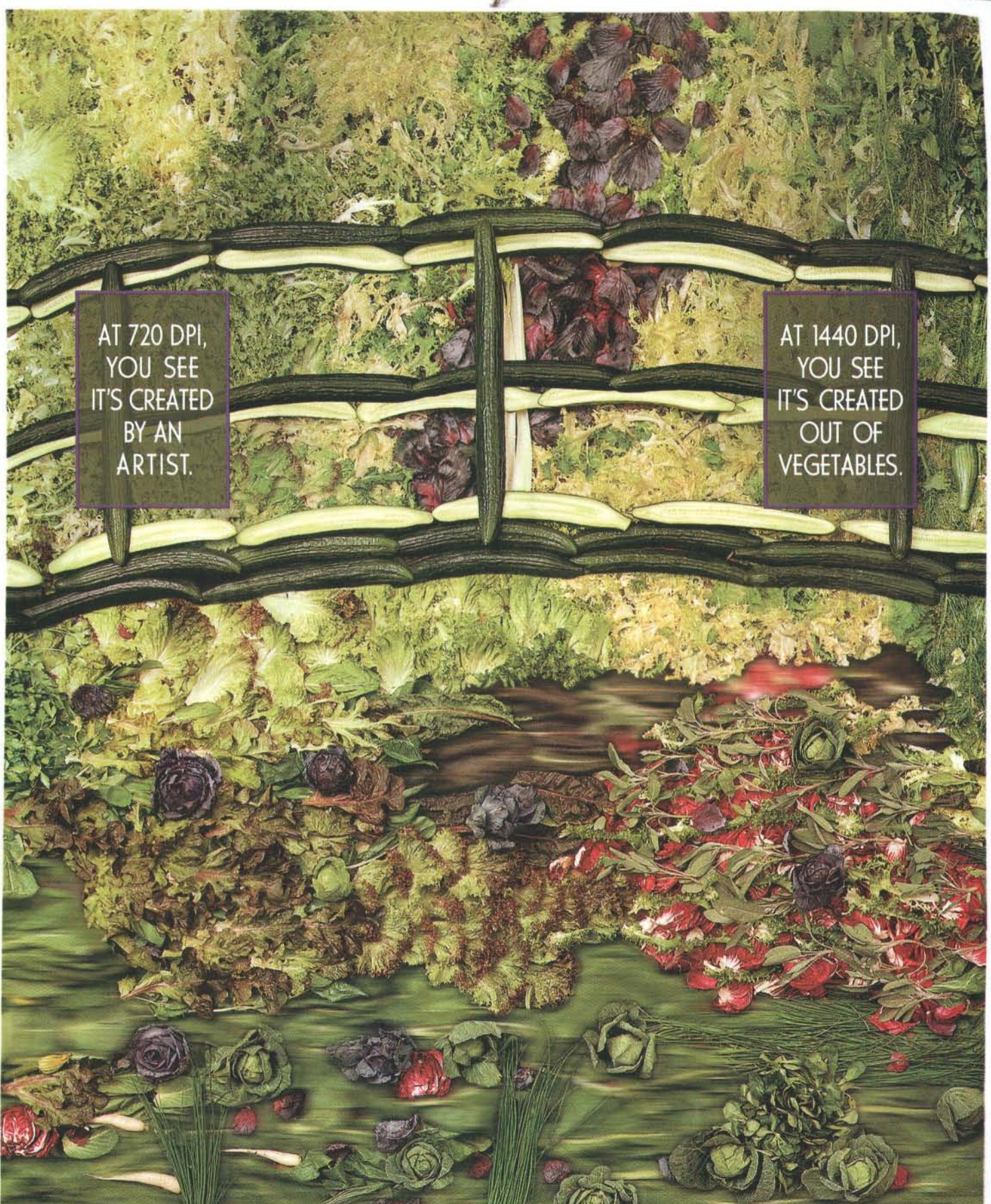


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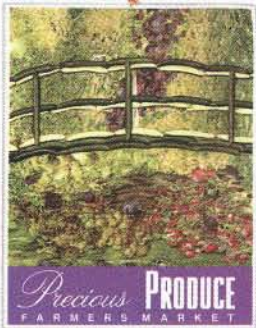
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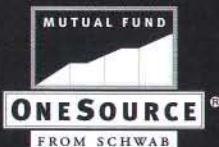
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RANTS & RAVES

82 Reasons Too Many

"83 Reasons Why Bill Gates's Reign Is Over" (*Wired* 6.12, page 194) was right on the money. As a 15-year programming veteran, all I need is one reason: Nothing has done more to cripple the evolution of the personal computer than Windows. As any software engineer will tell you, Windows (NT 4.0 also) is simply junk, and crucial systems cannot be run using it.

Christian Eidsmoe
chreid@safeco.com

First and Last

Several days ago a friend noticed that I was reading a magazine from back to front. Later, when I received my December *Wired* in the mail, I realized that I have been guilty of this habit for the past six years.

Nicholas Negroponte has been the thought-provoking front door to *Wired* since I first discovered this publication. He has helped us find not only some of the answers to how we embrace this new world, but also some very important questions. I don't know quite how I will start to read *Wired* 7.01, but I sincerely hope someone holds Negroponte to his promise of not straying too far.

Scott Gamble
bsgamble@ix.netcom.com

Government Tools

In "83 Reasons Why Bill Gates's Reign Is Over" I noticed the following in Reason 56: "[Microsoft's] presence is big and heavy, like the Pentagon's. But massiveness doesn't make you feel good about paying \$700 for a toilet seat." Then I remembered an interesting item on page 128 of "Wired Tools," which happens to be a \$699 toilet seat ("Bottom Line," *Wired* 6.12). Synchronicity.

Bob Hays
rhays@interaccess.com

Macrosoft

Compliments to *Wired* on a well-researched article. I guess the folks at Microsoft have their work cut out in order to prove you wrong. By coincidence, in the book *The 48 Laws of Power* by Robert Greene and Joost Elffers, I found this: "What is bloated beyond its proportions inevitably collapses. The mind must not wander from goal to goal, or be distracted by success from its sense of purpose and proportion. What is concentrated, coherent, and connected to its past has power. What is dissipated, divided, and distended rots and falls to the ground. The bigger it bloats, the harder it falls."

Alan B. Scholl
scholla@candw.ag

Running on Empty

While I enjoyed "83 Reasons Why Bill Gates's Reign Is Over," the real number of substantive reasons was more like 10. Most could be applied to anyone successful in the software business, and many were simply duplicative. Several, while humorous, were without substance or merit. It appears as if the initial goal in writing the piece was to have a "101 Reasons" article, but after about 10 or 15, someone ran out of gas. As a cover cutline, "10 Reasons" just has no ring to it. But the piece was definitely thought-provoking!

Darrell Owen
darrell_owen@msn.com

Caveat Vendor

Scott Kirsner's "Murder by Internet" (*Wired* 6.12, page 210), details a rather disturbing scenario. Conducting business — online or off — has consequences, especially if your intent is to scam people. As 17-year-old Chris Marquis discovered, the Internet is not the completely anonymous place that it seems. Even spammers must provide a contact address if they have any hope of separating you from your hard-earned cash. And deliberately causing harm to others can obviously come back to haunt you. Or, as in this case, kill you.

Armando Trevino
fbcn@earthlink.net

The Vision Thing

People have been writing Bill Gates's epitaph for years. But he's still around. Now, *Wired* has jumped on the bandwagon. To paraphrase another famous failed *Wired* prediction: Push technology will drastically alter the way that you use the Web. Give it up, *Wired*. Soothsayers you ain't.

Jeremy Fischer
jeremyfischer@hotmail.com



RANTS & RAVES

Young at Heart

At age 60, I still get blown away, this time by the first *Wired* I've ever seen. I received issue 6.12 yesterday, spent six hours reading it, and dreamed about it last night. May I still say "Wow!"?

I'm not retired, but I am lucky enough to be working from home on my new iMac. Registering some feature that came with my new computer is what got me 6.12, the first of three I'll get as a gift. I'll pay for the rest of the year.

Loved the photo of Gates sitting in a gray corner, looking as if he has blood on his hands. Noted that Jacques Leslie didn't mention that in Paris one may now use a credit card to drive little electric cars on errands, then just plug them in at a convenient

charging station and hop onto *le métro*. Glad I got to read even the last of Negroponte's columns, and hope I have the energy to remain conversant with what is coming so fast.

My elder siblings are not even on email, despite how I plead with them. Here we are in a new world driven by our kids, and not so-called adults. I hope you do it better than we did. Love your magazine.

Bill Wickland
wackyb@proaxis.com

Mom Will Never Know

I was a bit dismayed to see myself described as a "nondescript schlumpf" in André LaPlume's "The Big Tease" (*Wired* 6.12, page 191), but I suppose I don't mind too much as long as you promise not to send a copy of your magazine to my mother.

I do, however, feel obligated to point out a less subjective error. While I am proud to have my stories appear on *The Wall Street Journal Interactive Edition*, I actually cover the Internet for the *Journal's* print editions. The interactive edition has its own dedicated staff of reporters, and I promise you they are far more descript and far less schlumpy than I.

Tom Weber
tweber@wsj.com

Fight the Power

Time out! In "Do YOU Know Tony Podesta?" (*Wired* 6.12, page 180), the ideology is cleverly woven into the fabric of the story, but before we find ourselves nodding in agreement, I suggest the premise be closely examined: that no matter the intellectual brilliance or marketplace success of Silicon Valley, government is going to win, and the Valley better go along to get along.

Government doesn't have to be defined as a micromanaging, invasive behemoth with ultimate power over individuals and the marketplace.

With all due respect to Sara Miles and Tony Podesta, government can never really succeed long term as paternalistic, intrusive, and omnipotent. If Silicon Valley flexes its muscles and focuses its own power, it will be government that changes.

Jeffrey W. Gettleman
jeffg@examco.com

Toys for Totalitarians

I cannot be anything but shocked and sickened by Bruce Sterling's "Hardware for Hard Time" (*Wired* 6.11, page 136). I have subscribed to *Wired* since its inception, and although much of the technology discussed in its pages contains the potential for unethical use, *Wired* has always been open to questioning how these technologies will be utilized.

Sterling's piece, on the other hand, is a real milestone: the blatant huckstering of toys for fascists.

Those who would seek to profit from the suffering of others, in this case prisoners, might as well sell land mines, handguns, or heroin to grade-school kids.

Noel Phillip Rodriguez
Tucson, Arizona

Here Comes the Sun

Charles Platt's "What If Cold Fusion Is Real?" (*Wired* 6.11, page 170) was excellent in conveying the enigmatic qualities of cold fusion. However, he leaves the impression that independent energy systems are merely a possibility. In fact, they have been a reality for more than 15 years.

Most such systems involve photovoltaics. Several hundred thousand homeowners worldwide receive electricity from PVs. In the US, PV electricity is now about 150 to 200 percent more expensive than grid electricity, but it is projected to decline to competitive levels by 2002.

Christopher Swan
San Francisco

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Undo

Belly-Up: InuteroGarden, the maker of Tummy Tutor ("Incubator," *Wired* 6.12, page 100), is no more. ■ Harmonic Divergence: JBL's Simply Cinema ESC50 unit, not the Harmony CD player, is pictured on page 134 of "Wired Tools" ("Harmonic Convergence," *Wired* 6.12). ■ Minus One Degree: Robert X. Cringely is a pundit and author, but not a Stanford PhD ("The Double Life of Robert X. Cringely," *Wired* 6.12, page 178). ■ Fabricated URL: Greenbeans Fabrications's Web address is www.gbfab.com ("Just Chillin'," *Wired* 6.12, page 153).



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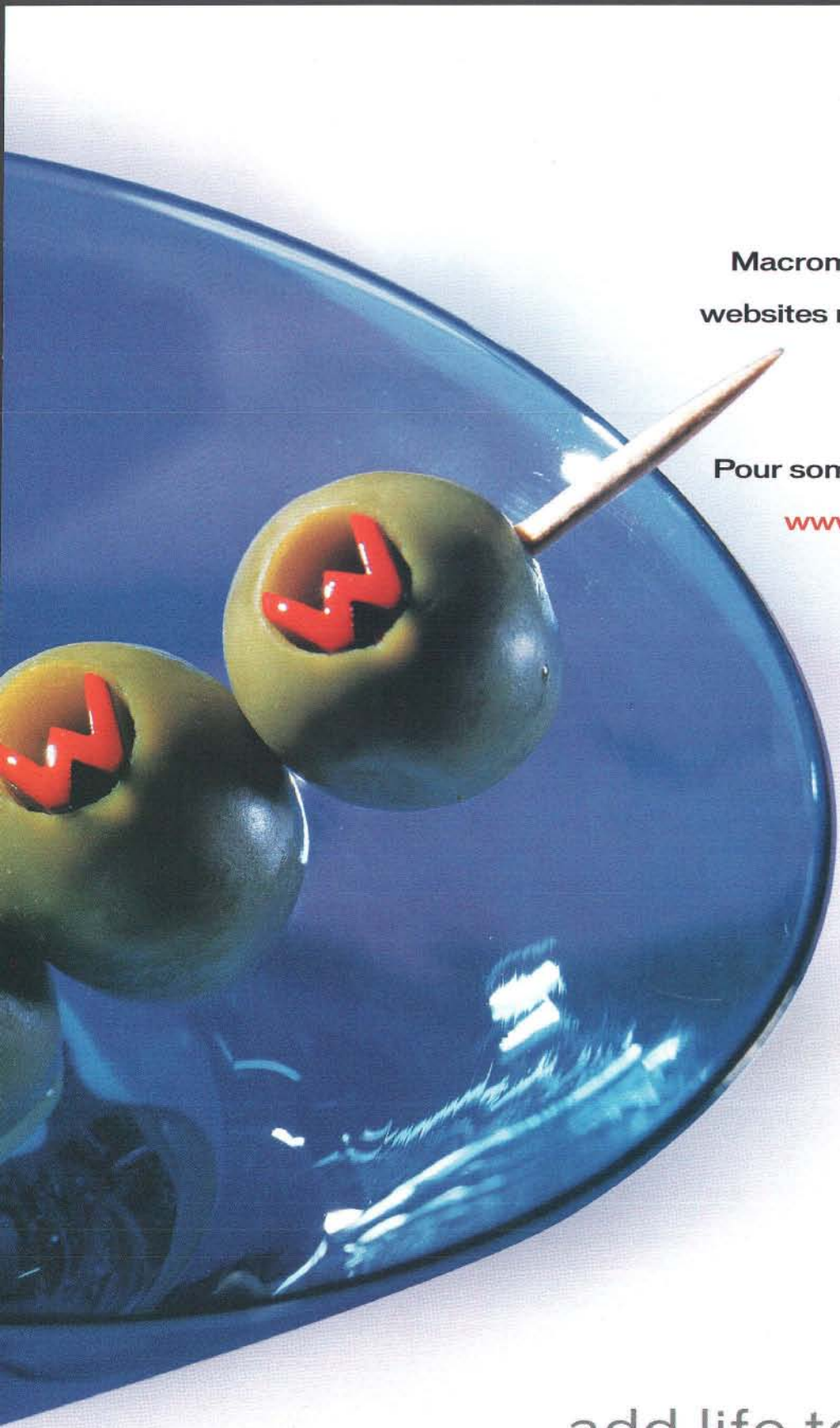
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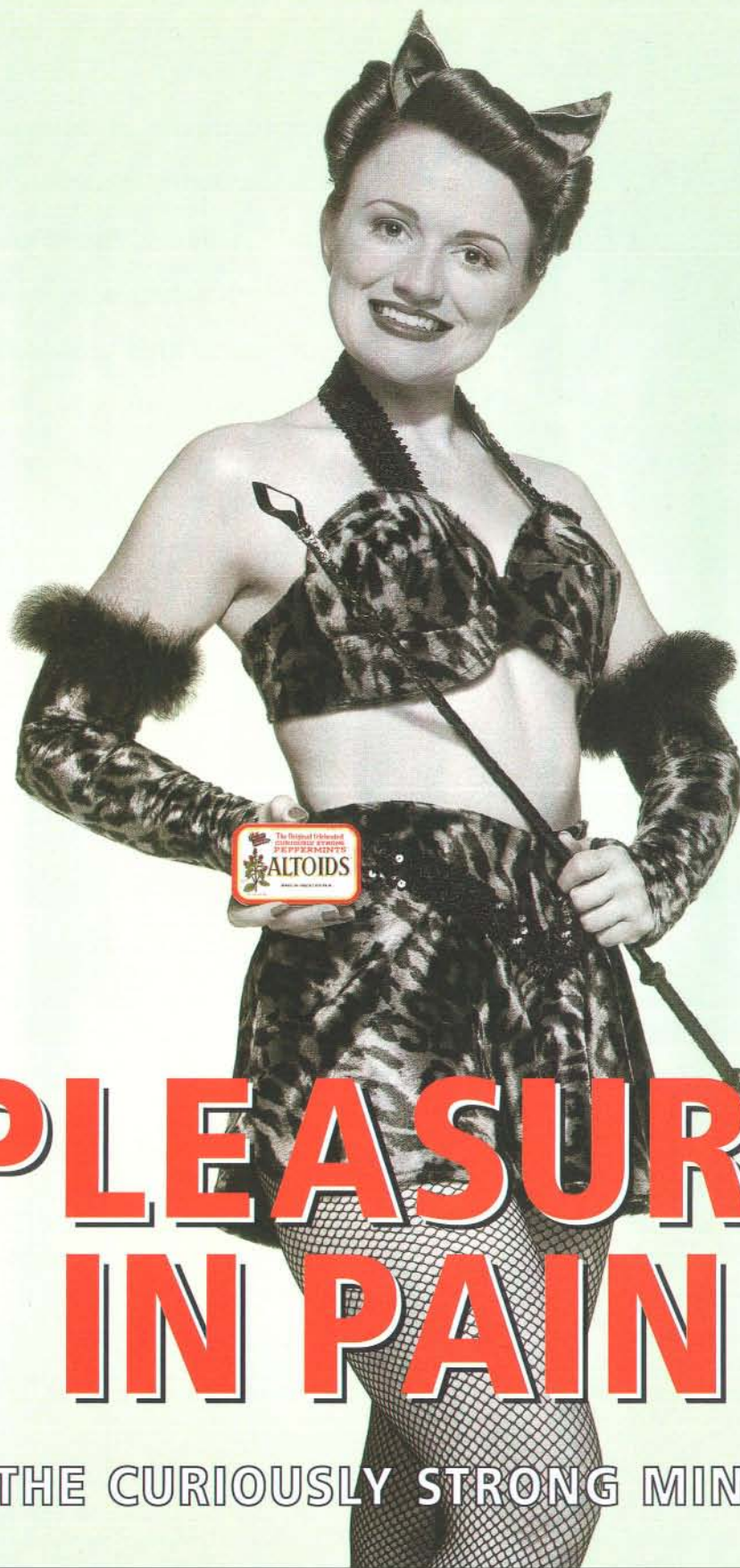


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Smile, smirk, sulk, scowl. The human face is capable of infinite expressions – expressions that virtually all of Hollywood's much hyped synthespians sadly lack. Which makes Jester (pictured) and Suit, the characters in *Tightrope*, a CG short by f/x house Digital Domain, all the more impressive. "There is no dialogue – everything is told through the faces," says director Daniel Robichaud.

The old approach of prebuilding the facial movements requires hours of work up front and never covers all the possibilities. Digital Domain's proprietary system, on the other hand, lets animators play muscle groups like a musical instrument. "The creative challenge," says Robichaud, "comes down to the acting ability of the animator." – Paula Parisi

IMAGE: DIGITAL DOMAIN

Prêt-à-Portable



Are you a Working Snob? Or a Tank? Tired of the cog-in-the-wheel gray of most laptops, Toshiba and Futurniture, a small Swedish design firm, created

a line of computers that reflect the personal styles of their users. Previewed well before the birth of the iMac, the first Le Tosh laptops – Working Snob (above), the

Tank, the Jackie K, and the White Box – are being sold in Scandinavia and online at www.letosh.com. The models range from \$2,800 to \$5,250, about 10 per-

cent more than standard Toshiba models. But “certain people are always going to be willing to pay more for something that looks good and says something about



IMAGE: HELENE SCHMITZ © TOSHIDA



their personality," says Le Tosh lead designer Dan Grettve. The Tank, for instance, has the look and feel of a heavy toolbox, while the Jackie K (above) has a smooth

mint nail-polish surface and comes with a white early-'60s-style tote.

Little surprise that Le Tosh originated in Sweden. Scandinavian countries have long been on the

vanguard of the cell phone business – an image-conscious industry that understands the importance of sleek lines and personal style.

– Richard Baimbridge

Warped Speed

Mark A. Altman (far right) and Robert Meyer Burnett found their muse at Toys "R" Us – in the action-figure aisle. *Free Enterprise*, the *Star Trek* homage by these longtime Trekkers and first-time filmmakers, hits theaters this spring, almost two years after they wrote the screenplay, raised the money, and called William Shatner for the first time. "We called

anyone who had ever met him," recalls Altman. "If we'd known his plumber we would have used that connection."

After the filmmakers rewrote Shatner's character as an over-the-hill, womanizing alcoholic, the star agreed. He also played with the script a bit, adding, for instance, the grand finale – a rap version of *Julius Caesar*.

– Jessie Scanlon

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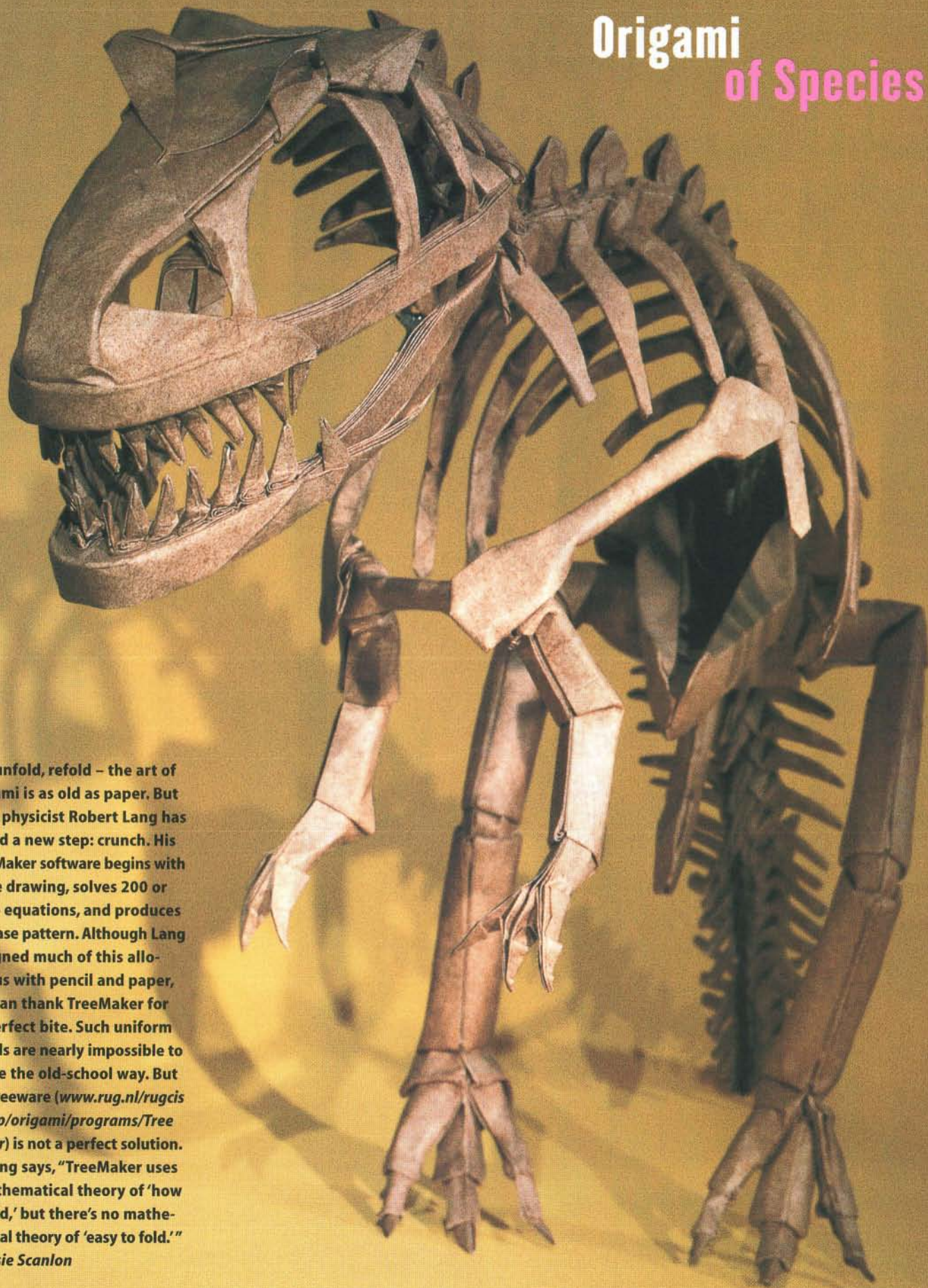


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Origami of Species

Fold, unfold, refold – the art of origami is as old as paper. But laser physicist Robert Lang has added a new step: crunch. His TreeMaker software begins with a line drawing, solves 200 or more equations, and produces a crease pattern. Although Lang designed much of this allosaurus with pencil and paper, you can thank TreeMaker for its perfect bite. Such uniform details are nearly impossible to create the old-school way. But the freeware (www.rug.nl/rugcis/rc/ftp/origami/programs/TreeMaker) is not a perfect solution. As Lang says, “TreeMaker uses a mathematical theory of ‘how to fold,’ but there’s no mathematical theory of ‘easy to fold.’”
– Jessie Scanlon



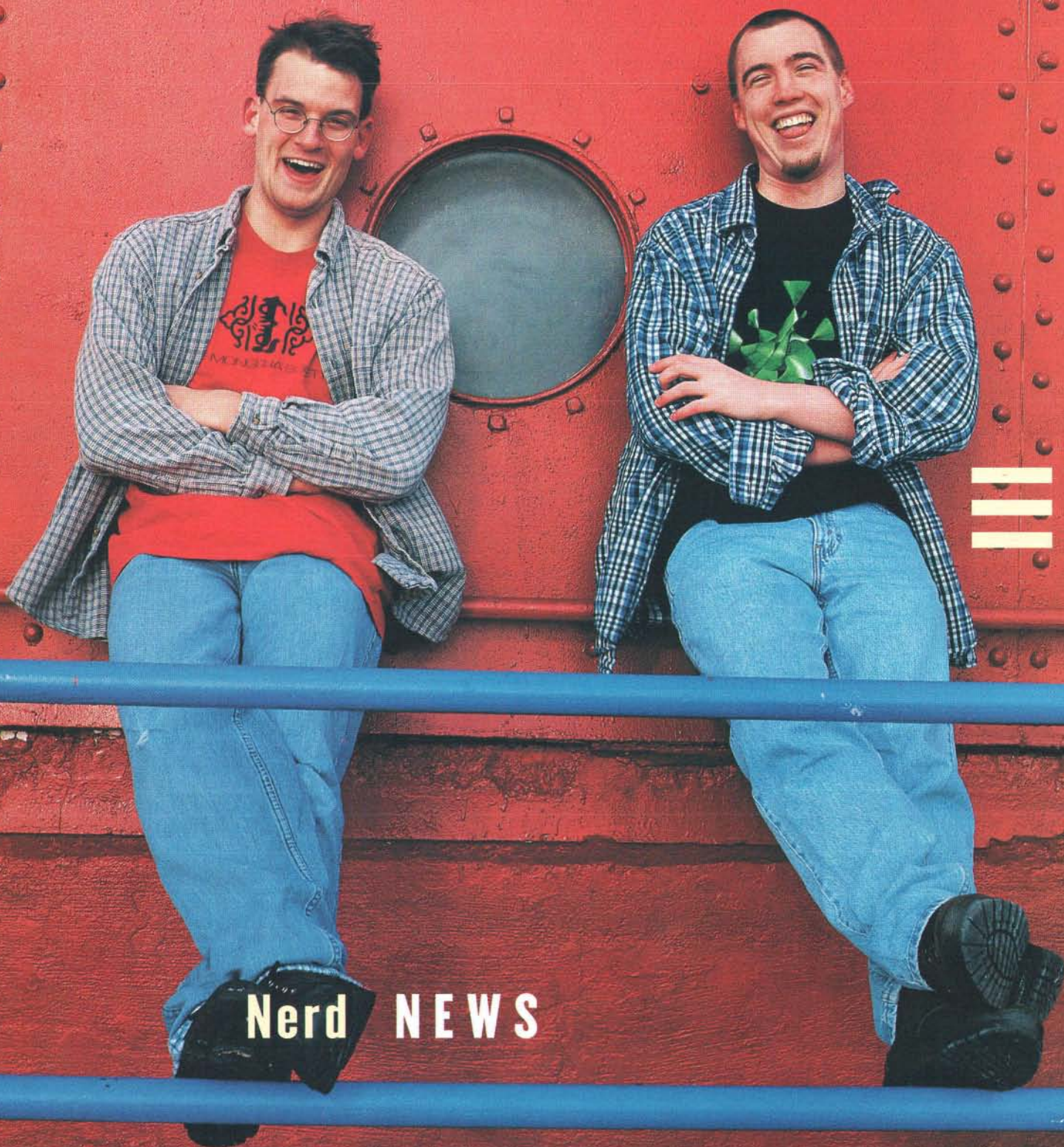
Working from a low-rent house in Holland, Michigan, Rob Malda and Jeff Bates run Slashdot.org – a must-read news service for nerds who embrace the spirit of

the open-source software movement. "This is a missionary site," says the bespectacled Bates.

Launched in mid-1997, Slashdot boasts more than 60,000

regular visitors. "We built it, and they came," Malda laughs. And they stay to argue in the site's discussion areas. Topics range from popular misconceptions

about Linux to reviews of *Star Trek: Insurrection*. Malda's geek critique: "This movie was worse than *Star Trek V*, which was also complete crap." – Todd Lappin



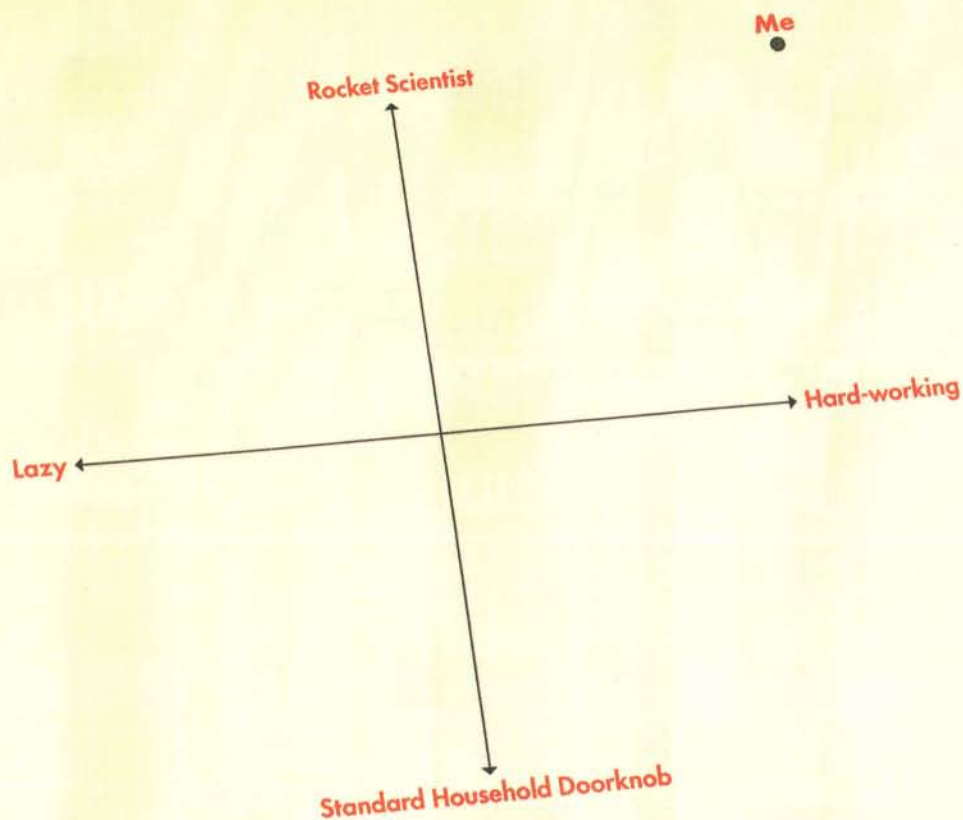
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F E T I S H



By Bob Parks



Fish Eyed

Digital cameras gave us the ability to see pictures instantly and to delete bloopers. Now they boast another advantage: 360-degree panoramas. This convex lens from Interactive Pictures works with Nikon's Coolpix 900 camera to pull in 183-degree shots. Then, with the included software, you can stitch two photos together to make a full 360-degree globe that viewers can navigate on CD-ROM, DVD, or the Web. The IPIX kit comes with the lens and software, but the camera's sold separately. IPIX Starter Kit: \$650. Interactive Pictures: (800) 336 7113, www.ipix.com.



Light Fare

The FlashBake oven looks like a tanning booth for food. Behind its tinted glass, eight 3,000-watt halogen bulbs strobe on and off, bombarding vittles with pure energy. And as if by some miracle of light, succulent chickens, flaky biscuits, and grilled vegetables emerge done to perfection. There's no preheating, and food cooks in about half the time it would take in a conventional oven. Commercial versions have been available for years, but the latest FlashBake sports a residential 120-volt plug. Time to turn off the Radarange for good? Wolf/FlashBake 120: \$1,595. FlashBake: www.flashbake.com.



Clapper Nouveau

With the IntelVoice light switch, you simply bark "Lights!" to turn overhead bulbs on and off. Conceived by VOS Systems COO Rick Matulich while he watched *Star Trek: Deep Space Nine*, the IntelVoice uses speech recognition. It even dims – just say "Lights low" to create that perfect mood from your love seat. There's also a touch-sensitive control for manual operation. IntelVoice Switch: \$49. VOS Systems: www.vosystems.com.



Easynet

Now available: an Ethernet connection from your backyard hammock. Thank Proxim, which has added cheap Ethernet access to its Symphony wireless home network. A laptop with the tiny Symphony antenna in its PC-card slot can roam up to 150 feet away and maintain access to broadband devices like ISDN routers and cable modems, as well as printers and hard drives. "Symphonize" all your computers, and your entire family (or all your coworkers) can have simultaneous connections to nearby devices. It's the easiest LAN you've ever set up – no looping of yellow Category 5 cable all through the house and into the back yard. Symphony Cordless Ethernet Bridge: \$399 (antennae extra). Proxim: www.proxim.com/symphony.

Moonlighting

Playing golf after midnight significantly reduces green fees – especially if you sneak onto the course. GlowOwl balls are a crucial accessory for such a covert operation. Unlike the hollow glow-stick variety, GlowOwls offer the heft and performance of ordinary golf balls and are visible from more than 250 yards down a pitch-dark fairway. The after-hours kit includes two balls and an ultraviolet lamp to cook them up between holes for optimal visibility. The dim, bluish light energizes the balls but isn't visible from far away – a feature trespassers will appreciate. Glow-Owl Twilight Pack: \$29.95. GlowOwl: www.glowowl.com.

Scene Stealer

This 32-inch digital television from Loewe (pronounced "LOO-va") is much clearer than a traditional tube, especially when you have a digital source like a DVD machine or a set-top box. While Loewe's Calida is not technically as sharp as a high-definition television, its 480 lines of resolution and progressive-scan technology make it a natural for HDTV. It also has a neat optional Euro stand and matching VCR. Calida: \$3,500. Loewe: www.loewetv.com.



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Giga

The Siemens Gigaset 2420, a new high-water mark in cordless phones, can accommodate not only two incoming lines but also eight handsets – each with its own extension. The base station, which includes a large-capacity digital answering machine, works on the high-frequency 2.4-GHz radio band, making the system nearly as clear as a landline. With forwarding and speaker-phone functions, the Gigaset is marketed as a small-business phone, but the ability to call from one handset to another also makes it useful for a family – unless your teenagers conference in both lines at once. Gigaset 2420: \$399. Siemens: +1 (972) 997 7300.

Jabberwalky

The trouble with digital voice recorders has always been the laborious process of transcribing your disjointed ramblings, but Dragon Systems offers a quick way to turn those musings into text. The NaturallySpeaking Mobile's recorder uses a compression scheme tailored to transcription, along with speech-recognition software on your PC. Just dock the unit into the serial port and bring up that email you composed while walking down the street. The little listener comes with PC software and has the patience for up to 40 minutes of dictation. NaturallySpeaking Mobile: \$299. Dragon Systems: www.dragonsys.com.

Catch and Release

Yachting and fishing enthusiasts alike lose anchors all the time. Inevitably, one gets caught on a fallen branch or a sunken mafia stool pigeon, forcing skippers to cut their losses. The Get-A-Way Anchor, however, is a keeper. If it gets stuck, just use the handy second line to release its flukes. Says inventor John Werling, the guy who came up with that Velcro dart game and the bottle for Lipton Sun Tea, "There's money to be made in anchors. I guarantee it." Get-A-Way Anchor: \$249. J. M. Werling Manufacturing: +1 (702) 796 9448.

Thanks to Evan Ratliff.



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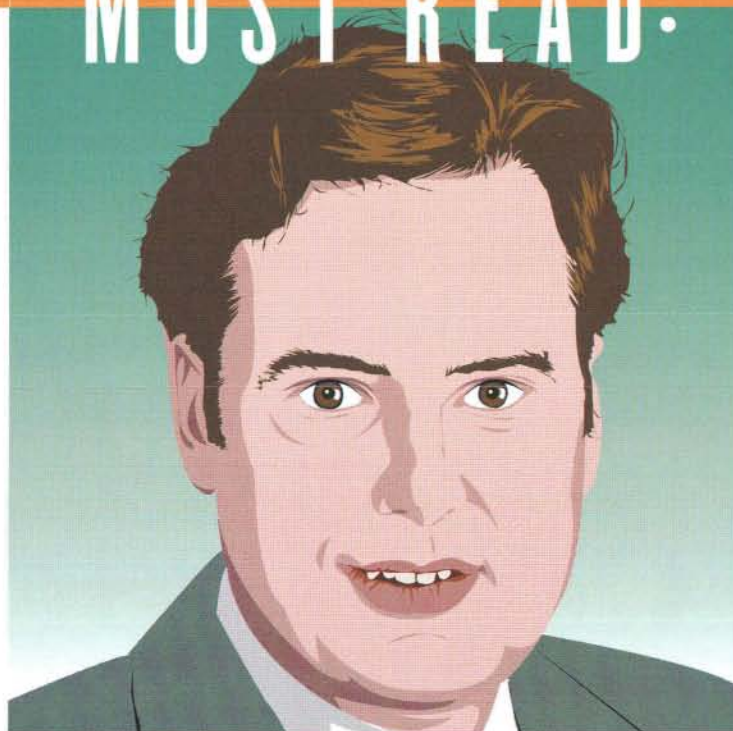
INTERNET TV

Fight!

One of the biggest bouts of 1999 has America Online facing off against Microsoft's WebTV for the Internet TV title. In one corner there's AOL's Barry "the Bruiser" Schuler and his 15 million pairs of eyeballs. In the other is WebTV's scrappy Steve Perlman and his 700,000 subscribers.

Already Perlman is out there swinging. His service will no longer run only on proprietary boxes, but on a range of devices from TVs to handhelds. And the WebTV Net browser has been morphed into an enhanced product with digital recording and pause. This spring, Perlman introduces WebTV to EchoStar's 1.9 million satellite-TV subscribers. By the end of the year, it'll be available on RCA TVs, Scientific-Atlanta digital set-top boxes, and potentially 5 million TCI boxes.

AOL arrives late to the game but with formidable strengths:



WebTV's Steve Perlman would like to KO AOL.

Net-TV technology from Net-Channel and an army of Netscape coders, not to mention programming expertise from partner CBS and AOL prez Bob Pittman, an MTV founder. AOL TV head Schuler won't say more.

Perlman's up to the fight. A veteran of star-studded failures General Magic and Catapult, the brash engineer was so vocal and passionate at his first job, at Apple, his desk was moved to a

remote corner. "Steve won't take no for an answer," says Konstantin Othmer, a former coworker and now cofounder of Full Circle Software. "You can keep throwing hurdles in his way and he'll keep finding workarounds."

These days, Perlman hasn't been tamed one lick by reporting directly to Steve Ballmer, but he claims to be savvy: "I'm getting pretty experienced at this thing." — Amy Johns

PRIVACY

Quick, Hide Your Money

Here's another reason to love the IRS: a proposed Know Your Customer program that would require banks to closely monitor transactions and report "suspicious" behavior to the authorities. Under the plan, reports of questionable deposits or withdrawals will be sent to a unit of the US Treasury Department, where officials can funnel reports to any agency they deem appropriate, from the FBI to the IRS. The plan is part of a global effort to reduce drug-related money laundering, but critics charge it wipes out privacy instead.

The good news? The proposal isn't official yet, and you have until March 8 to voice your opinions about banking with Big Brother. Talk back to comments@fdic.gov. — Declan McCullagh

PSYCHOLOGY

Confronting E-Grief

Business consultant Larry Downes, coauthor of *Unleashing the Killer App*, was so busy counseling corporate execs on digital strategy last fall that he didn't spend two consecutive nights at home. To soothe the souls of worried clients — freaked-out wholesalers, insomniac marketing VPs, and CIOs rapidly fraying at the comb-over — he began prescribing some unexpected reading: Elisabeth Kübler-Ross's 1969 classic *On Death and Dying*.

Everyone had one thing on their minds, says Downes: how the shift from physical to digital threatens their business. What's more, each showed signs of passing through the five stages of grief that Kübler-Ross says accompany the discovery of terminal illness. — Brad Wieners

Denial: "As soon as network-security issues are addressed, we'll get started. Time is on our side."

Anger: "What do the words *burn rate* mean to you? Those online idiots are losing their shirts! Not me, bub."

Bargaining: "You want eyeballs? We got eyeballs. We add value. There are a

lot of synergies on this thing."

Depression: "We'll never make it. They haven't made a buck and they're worth a hundred times what we are."

Acceptance: "OK, so we have to spend a bit to keep customers long term. Change is good. Let the cannibalizing begin!"



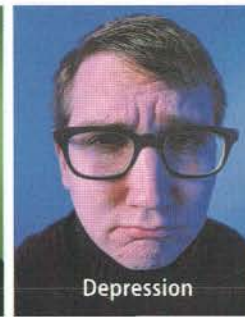
Denial



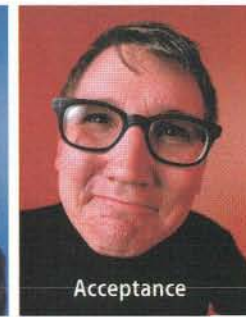
Anger



Bargaining



Depression



Acceptance

Jargon Watch

Blue Snails

Friendly online term for US postal workers.

Car Cloning

A method of making a stolen vehicle "disappear" by copying another auto's license plate and vehicle ID and applying them to the stolen car.

Click-Wrap Agreements

The software-licensing agreements that go into effect when you click the I Agree button; the virtual version of the long-standing "shrink-wrap agreement." Also called "Web-wrap agreements."

Greenspeak

The often impenetrable conundrums that Alan Greenspan utters. Interpretations of Greenspeak can cause the market to rise or fall, in what is known as the Greenspan effect.

Toxic Worriers

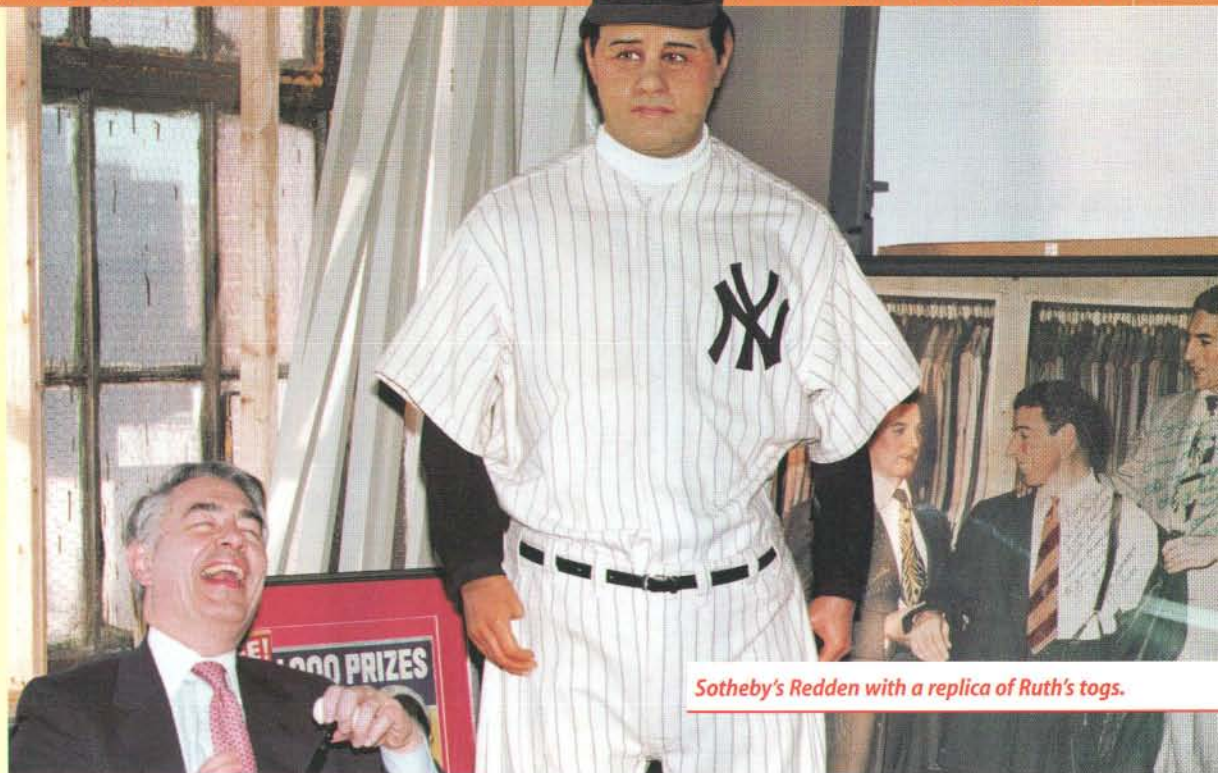
People who obsess over everything that could possibly go wrong – to the point of paralysis. Toxic worriers are two and a half times more likely to suffer heart attacks than less stressed-out individuals.

Facebase

A visual database used in the computer-based recognition and identification of a face.

Tip o' the golf cap to Ernest Limperis and Paul McFedries.

– Gareth Branwyn
(jargon@wired.com)



Sotheby's Redden with a replica of Ruth's togs.

ECOMMERCE

Here Comes the Slugger

Heads up, eBay – this summer Sotheby's is taking the field. The New York auction house that put Jackie O's humidor on the block will auction off the world's largest private collection of baseball memorabilia, says executive VP David Redden – and it'll do so exclusively online.

Sotheby's baseball cache, called the Barry Halper Collection, is an auctioneer's dream – almost 1,000 uniforms and 30,000 baseball cards, as well as Ty Cobb's dentures and Mickey Mantle's first signing-bonus check. But it's not just the quality of the Sotheby's collection that makes eBay look like the minor leagues – it's the deep pockets the auction house attracts. In 1997 Sotheby's cleared \$1.84 billion in sales, and last year it took in \$33 million for

a single Monet. By comparison, eBay's sales from its '95 launch through Q3 '98 were just \$34 million. The upstart competes with its seasoned antecedent in sheer volume, however: Last year, Sotheby's put 150,000 lots (of both single and group items) up for sale; eBay posts 150,000 new items *a day*.

But whether or not the old-timer can match eBay's pace – or its technology (Sotheby's first venture online was markedly primitive) – it can still boast trust. With a name like Sotheby's, you don't expect your clientele to suffer crooks. So while eBay doesn't see the goods, leaving buyers at risk of paying for items that are never delivered, make a purchase at www.sothebys.com and you'll know that bat is already in-house. – Austin Bunn

CREDIT CARDS

Insta-Money Hits the Web

Credit limit cramping your style? NextCard, touted as the first Visa to offer instant credit approval over the Web, tells you within 30 seconds if you can go on a spree. But the real genius of NextCard is its guarantee against fraud. It's making a virtue out of the fear folks blame for slowing ecommerce growth:

Go ahead, divulge your card number! We'll guarantee you lose nothing! NextCard is a smash and already has rivals, including the Yahoo! Platinum Visa. Now, as a second act, it has announced the rollout of My Visa, the first design-your-own charge card you personalize with a digital pic. – David Case



Cadillac

OH, GET A GRIP.



It's called StabiliTrak. The world's most advanced integrated stability control system, it helps you enjoy the powerful sense of control inherent in Seville STS with the Northstar System. StabiliTrak actually senses when weather may have compromised road conditions, or when you've gone into a tight turn a little too hot, and adjusts its braking and suspension to keep you on your intended path. It works so well, STS even beat the BMW 540i in USAC certified slalom tests. StabiliTrak...one of the many gripping reasons why Seville STS is what's next.

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IT'S WHAT'S NEXT.™

Hype List

Ranking Tendency

Life Expectancy

1 ▲ Wireless Data Devices

24 months

Microsoft recently reached out and touched Qualcomm in a megabuck joint venture aimed at making room for MS Outlook et al. on wireless data devices. Meanwhile, Qualcomm independently released the pdQ smartphone, a version of the Palm that doubles as a cellular. And 3Com is unveiling the Palm VII, which is configured to handle wireless computing. So it appears these devices are going to be big. Very big. Still, their success depends as much on the telcos as on the hardware companies. And while there's plenty of demand, who really needs a gadget that can't operate for more than a few hours continuously, has a tiny grayscale display, and typically costs 25 cents per minute for a 9.6-Kbps connection – with high error rates? Connect. Disconnect. Crash.

2 ▼ Electronic Wallets

6 months

"Caveat emptor!" Thus scream many an e-shopper waking at night in a cold sweat. CyberCash wants to be your "trusted third party," housing your vital stats – credit card number, mailing address, et cetera – so you can shop anywhere on the Web using just one order form. eWallet wants you to download a 1-meg app that acts like a desktop billfold. But server side or client side, it just don't matter. With Amazonians happily pounding those 1-Click buttons located conveniently next to every offering, the security and convenience of an electronic wallet are already provided.

3 ▲ Semantic Traffic Analysis

18 months

Network service providers are betting their future on finding a more profitable alternative to flat-fee access. One solution is activity-based tiered billing, but for that to happen there needs to be a way to determine what each individual customer is up to – emailing, surfing, video-conferencing – at any given moment. A company called Narus says it's found the answer: semantic traffic analysis. Unfortunately, semantics are not solutions. Sure, the service dumps a litany of data about individual end users into an enormous database, but making cents out of those stats is your job – as is, alas, managing bandwidth. Narus is like the lazy in-law who tells you your house is a mess but won't lift a finger to help.

4 ▲ Robotic Pets

24 months

As if Furby worship weren't bad enough, Sony is busy developing a set of entertainment robots that will act as mechanical pets for folks unable or too lazy to care for the real thing. The furless companions pack a fair amount of processing power. A PC card slot allows prospective owners to plug in different animal behavior modules, and interchangeable limbs can transform a mechanical monkey into, say, a dog drone. This is a great idea for the Tamagotchi set, but since most Americans can't even program the VCR, there might be quite a few strays roaming the streets. Besides, how do you put a mechanical toy to sleep? Can it be neutered?

– Jesse Freund (hype-list@wired.com)

SPECTRUM AUCTIONS

Going, Going, Again

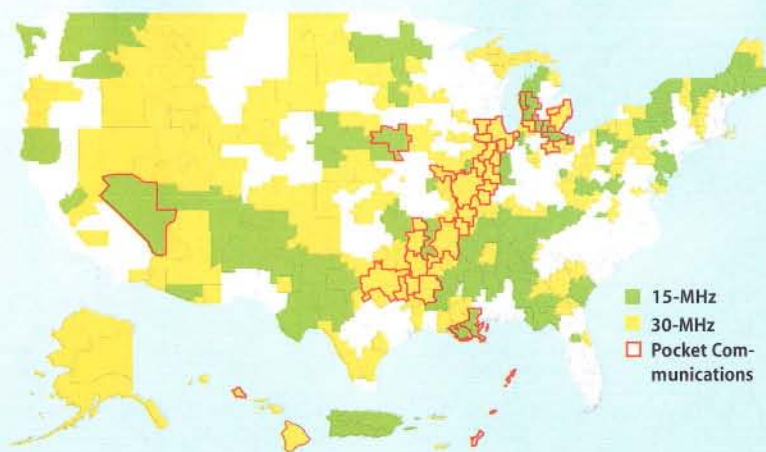
Three years ago, the broadband PCS auctions for small businesses began with grand, gavel-banging flair. Today they have all the panache of a playground flea market. On March 23, the FCC will once again attempt to unload PCS radio spectrum – used mainly for digital phone services – left behind from the original auctions.

Congress originally bet that federal budget woes could be offset by allowing businesses to bid on prime radio real estate. After bringing in more than \$10 billion in bids, the auction was deemed a wild success. Then the process began to sour. Several winning bidders ran into serious financial problems, leaving them unable to pay for the spectrum they had purchased. Now, 42 PCS licenses once held by Pocket Communications, since bankrupt, will go up for bid, along with another 314, most of which are from other companies that could not cover their bets. Among the licenses up for grabs again are those that service Chicago, Dallas, and Phoenix. The auction should raise at least \$158 million,

but it won't likely reach the \$3.1 billion the spectrum raised in 1996. On the other hand, it's a bundle more than the \$13.6 million the FCC drew from the Wireless Communications Service auction in '97. Those proceeds were a mere 6 percent of the total ante required just to bid on a license.

The biggest problem plaguing the PCS auctions is one the government is not likely to solve. Most of the licenses up for grabs are entrepreneur blocks, meaning only smaller companies – those with gross revenues of less than \$125 million for the past two years and total assets of less than \$500 million – are eligible. Intended to foster competition and innovation, this rule fomented more problems than it solves: Smaller companies don't have the financial footing needed to compete in a telecom market that encompasses the globe.

And while the FCC might auction and re-auction till doomsday, the financial community can't be expected to embrace little telecom wannabes. – Tim Barkow



The above map is divided according to licenses available for purchase on March 23. All of the 15-MHz C block licenses (green) were returned to the government by bidders opting to simply give portions back rather than foot the bill. Most of the

30-MHz C block licenses (yellow) were also returned under amnesty – except those owned by Pocket Communications (outlined in red), which filed for bankruptcy and was forced by the courts to relinquish nearly all its licenses.

7200 RPM performance.



Pit crew on board.



It takes more than a supercharged processor to keep your PC at the head of the pack. It takes a new class of hard drive as well. The 7200 RPM **WD Expert™** family from Western Digital leaves conventional 5400 RPM drives far behind—operating 20 percent faster on average, according to Winbench benchmark tests.¹ You also get the enhanced performance and data integrity of the new **UltraATA/66** interface. As well as **DataLifeGuard™**—WD's exclusive automatic defect detection, isolation and repair technology. So your drive can actually fix itself, without taking you out of the race for a second. Upgrade to a WD Expert drive today. And discover just how fast your PC can really move. www.westerndigital.com

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¹The tests were performed without independent verification by Ziff-Davis and Ziff-Davis makes no representation or warranties as to the results of the tests.



New Gage

It's hardly a surprise that the Internet Society tapped **John Gage** to fill the seat vacated by the death of John Postel. As Sun's chief research officer, Gage certainly has good tech references, though lately he is better known for social activism, including founding the school-wiring initiative Net Day. But Gage's interests are a natural fit as the Internet Society looks to broaden its scope. He hopes to expand membership and start projects like a digital Peace Corps to wire developing nations. "I don't have Postel's technical expertise," admits Gage. "My interest is outward-reaching – not protocols, but technology's impact on society." – *Jesse Freund*

Sugar Muther

When **Catherine Muther** retired from Cisco in 1994, the former VP of marketing had a lot of paper money and even more time on her hands. Today, the stock bolsters a \$5 million endowment for her Three Guineas Fund (named after a Virginia Woolf book about charity), and her time is occupied solving "access issues for women and girls." Her latest project is the Women's Technology Cluster, a San Francisco-based incubator for women-run tech outfits. "Capital has traditionally been a barrier to aspiring women entrepreneurs in technology," says Muther. That's a problem she hopes to fix. – *Jesse Freund*

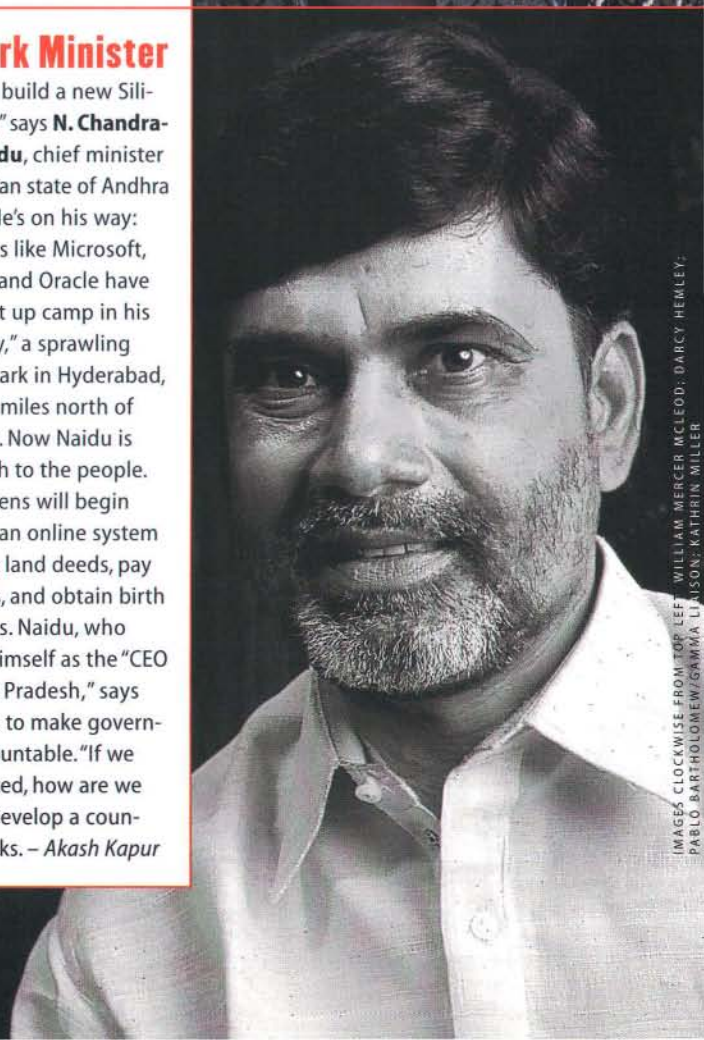


Matchmaker

When **Rebecca Patton** joined E*Trade as VP of marketing in 1995, the company wasn't even on the Web. As E*Trade's popularity shows, she not only did a good job of promoting the site, but also brought more people into the previously highfalutin financial community. So why did Patton leave to lead Della & James, an online gift registry that aims to do for weddings what E*Trade did for securities? "I couldn't pass up the start-up opportunity," she says. First up for the marketing ace: publicizing the oddly named venture. "We consciously avoided something like Weddings.com," she says, hinting at the obscure nuances of online branding. – *Jesse Freund*

Network Minister

"I want to build a new Silicon Valley," says **N. Chandrababu Naidu**, chief minister of the Indian state of Andhra Pradesh. He's on his way: Companies like Microsoft, Metamor, and Oracle have already set up camp in his "hi-tec city," a sprawling infotech park in Hyderabad, some 200 miles north of Bangalore. Now Naidu is taking tech to the people. Soon, citizens will begin accessing an online system to register land deeds, pay utility bills, and obtain birth certificates. Naidu, who refers to himself as the "CEO of Andhra Pradesh," says the goal is to make government accountable. "If we are outdated, how are we going to develop a country?" he asks. – *Akash Kapur*





Leap of Faith

"My bridge-jumping days are over," proclaims **Miko Matsumura**, the former Java evangelist for Sun. Matsumura once donned the marshmallowy garb of the company's mascot, Duke, and bunged off a bridge to prove his devotion to the programming

language. But the networking master, who claims to have evangelized more than 100,000 people, recently left in hopes of converting his faith into IPO riches. Matsumura signed on to be the chief strategist at BusinessTone, a start-up that plans to harness Java to

offer small companies resource management tools over the Web. "There are 8.5 million businesses worldwide," says Matsumura, explaining why Java's ubiquity and enterprise software's high price tag add up to easy money for the start-up. — *Jesse Freund*

IMAGE: JASON HEMLEY

Home(page) Schooling

Everyone loves virtual field trips – especially adults who get paid to play. **By Jessica Shattuck**

Corporate America has been trying to weasel its way into schools since the advent of Channel One, which parents lambasted for frequent TV-like commercial breaks. Today, virtual adventures – live expeditions transformed into Web sites for classrooms – not only give corpo-

underwriters for their travels. Of course, some educators balk at the commercial presence. “Like many sites,” says William Rukeyser, coordinator of Learning in the Real World, a nonprofit that provides research grants to universities for rating various educational technologies, “some virtual

expeditions. “As the market [for funding] gets tighter, some long-time adventurers are turning to the educational market.” Not a bad way to pay for your hike up Mount Fuji.

But what about the kids? “Lots of sites are finding an audience because teachers have new

those with little or no teaching cred and run by pragmatic explorers who give their trips educational spin just to attract funders, kids go for them simply because they’re not the umpteenth day trip to the local history museum.

“I’d rather go on a virtual field trip than go to the museum,” says Gil Zamsirescu, a sixth-grader at Hunter College Elementary School in Manhattan. “It’s easier and you learn more.” That sentiment, echoed by many other kids in his class, might not produce brilliant anthropologists, but it bodes well for the nascent adventure business. ■ ■ ■

Jessica Shattuck (jshattuck@yahoo.com) is a freelance writer living in New York City.

Companies get young eyeballs, trekkers get funding, and the kids get six hours of school and a few JPEGs.

rations entry into the classroom, but also send grown-ups on exotic vacations: Companies get young eyeballs, trekkers get funding, and the kids get six hours of school and a few JPEGs.

One of the early Net-based educational voyages, Virtual Galápagos, set off in 1996 on a tour of 21 islands in the historic archipelago, from which explorers posted live dispatches to the Web and answered student email. The trip was devised as a joint venture between two companies: Adventure-tour firm Mountain Travel-Sobek handled the itinerary and expedition logistics, while WorldTravel Partners, a trip-management and travel-technology outfit, provided the funding.

According to Mark Campbell, marketing director for Mountain Travel-Sobek, one of the primary reasons for devising Virtual Galápagos was exposure to the education market. “WorldTravel Partners received the PR they were looking for,” he says.

Now, with more than a dozen groups peddling virtual field trips, corporate sponsors have a new way to connect with kids, and adventure teams get new

adventures are self-promotional and some are thinly disguised corporate advertising sites.”

Which isn’t surprising. Phil and Carol Dunn’s upcoming Internet Circumnavigation Education Expedition is planned as a powerboat voyage around the world, during which they will correspond with US classrooms over the Net. In trying to woo sponsors, their site advertises “2 million kid impressions per day and an innovative way to stay in touch with the teenage and family market.” The Dunns are in talks with Kellogg’s Fruit Loops, but Phil Dunn says an alliance won’t change the way they run the trip. “The only connection might be that we paint the boat with Toucan Sam,” he says.

Then there are the more everyday explorers who don their educational hats when traditional backers get tapped out. Sponsors like The North Face are swamped with more than a hundred pitches a month for funding. “The expedition business is a business,” says Eric Robertson, president of Learning Outfitters, a for-profit company that builds and sells online curricula based on existing

systems in their classrooms and they’ve got to put something on screen,” Rukeyser says. “But many Web sites format themselves like the student is the explorer and anything an explorer can do, a kid can do; actually, they can only do what the person who put together the site anticipated.”

While it’s sometimes the case that virtual adventures are contrived by

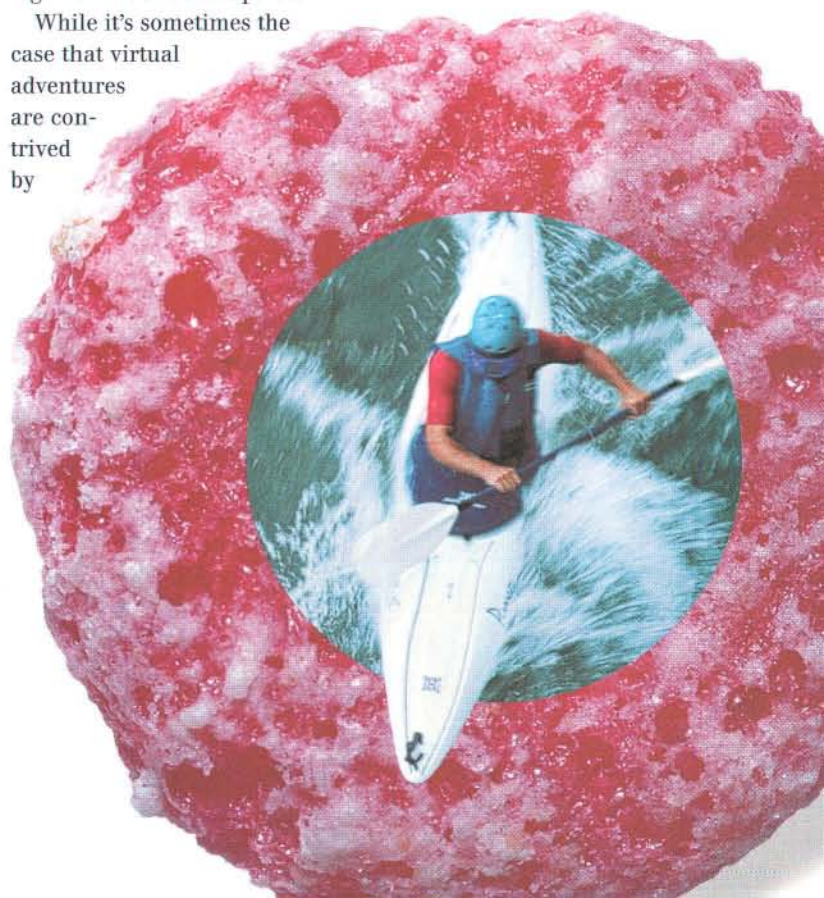


IMAGE OF FRUIT LOOP: KEVIN RILEY; RAFTER: SUPERSTOCK



IBM

Ethical Hacker

Name:	Nick Simicich
Job Description:	Help determine whether or not a mission-critical information system is susceptible to hackers.
Experience:	Protected the electrical power infrastructure in the U.S. from cyber-jackers bent on misdirecting electricity with bogus information.
Unofficial Title:	"Paid Professional Paranoid"
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Tomorrow Today

Fall 1999 | Yellow Brick Show

Columbia TriStar retools L. Frank Baum's *Wizard of Oz* as a TV series. Behind the curtain, movie maestro Tim Burton orchestrates the hour-long drama, which fleshes out some of the lesser-known characters of Munchkin Land.



Q1 2000 | Radio Shackles

The US Department of Transportation and law enforcers track problem drivers with a credit card-sized radio tag. Attached to the grilles of road terrors, the tag alerts police in the vicinity by broadcasting nanosecond pulses – less susceptible to interference than longer signals – that carry the driver's stats and photo.

April 2000 | E-Hancock

The nation's capital becomes a test bed for electronic signatures and other certification technologies. Following US Office of Management and Budget guidelines, agencies must implement commercially available schemes, choosing among systems using PINs, electronic thumbprints, even retinal scans.

2006 | Neo-Esperanto

Members of the United Nations begin speaking the same tongue – the Universal Networking Language. Devised by Tokyo's United Nations University, Web-based translation software enables the 185 member countries to convert text from one language to another with ease.

– Jennifer Hillner
and Patricia Krueger

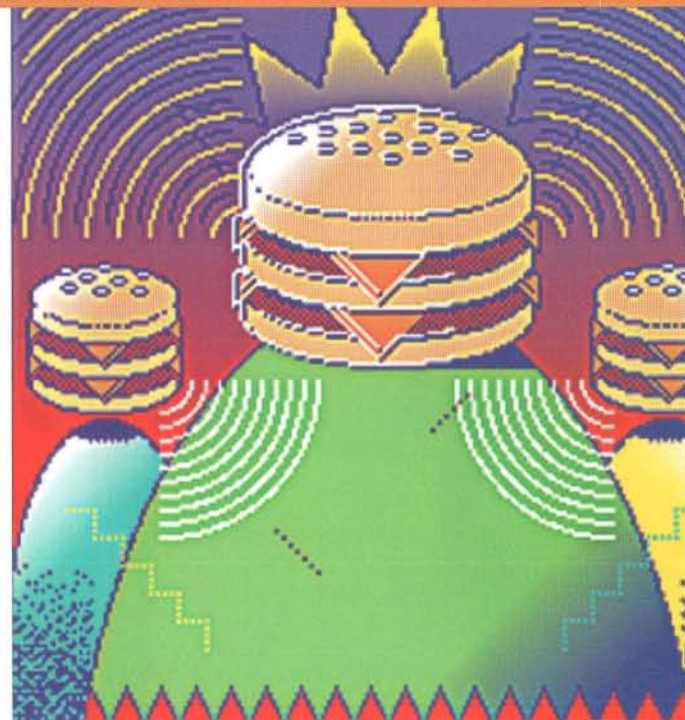
ISPS

McService Providers

No one doubts the success of franchising when it comes to fries. Now Quik International is testing the Golden Arches model for the fast-growing ISP biz. For a \$60K start-up fee, Quik provides infrastructure from its Irvine, California, offices and bandwidth from Sprint, WorldCom, and Qwest – leaving its franchisees responsible for marketing dollars and customer support, including a contractually stipulated storefront office open to walk-ins.

So far, so good: Cofounders Jack Reynolds and Murray Mead say 2-year-old Quik was profitable from the start, saw revenues jump from \$800,000 in 1997 to \$4.5 million in '98, and now has 75 stores in the US and another 10 abroad. The model works, they argue, because customer service is local, while quality control is centralized. Says Reynolds, "We do McDonald's one better: franchises are free to concentrate on the customer while we cook the burgers." Achmad Chadran, an analyst at Aberdeen Group, sees another plus: "Unlike ISPs that are growing through acquisition, Quik won't have to deal with a lot of redundancy."

"There's a franchising opportunity offshore and in parts of this country where there isn't high saturation," adds Zona Research analyst Jim Balderston – and Quik is his proof. Its first



franchise was in Reno, Nevada; another, in Wichita Falls, Texas, is covering operating expenses with a modest 1,500 subscribers; and Quik's Guatemala City franchise claims a solid 25 percent marketshare. But even in highly saturated San Diego County, among some 250 competitors, franchisee Kurt Davey broke even in under a year and held on to 99 percent of his users. – *Ilan Greenberg*

NEW MATERIALS

What Stuff Is Made Of

Thomas Edison scoured the planet to find the perfect lightbulb filament, but only after zapping thousands of candidates did he hit on a winner – carbonized sewing thread. Today's inventors rely on the same sort of serendipity, but Symyx, a start-up in Santa Clara, California, is pioneering a process that could ID new materials for everything from microchips to battleships.

As a UC Berkeley chemist, Symyx cofounder Peter Schultz realized that combinatorial synthesis – the technique budding biotech companies use to hunt for new drugs – could be co-opted for materials science. His process starts by applying a mist of various chemicals through a selective filter to a polished crystal wafer. The result is an array of thousands of tiny samples, each with slightly different ingredients, that allows

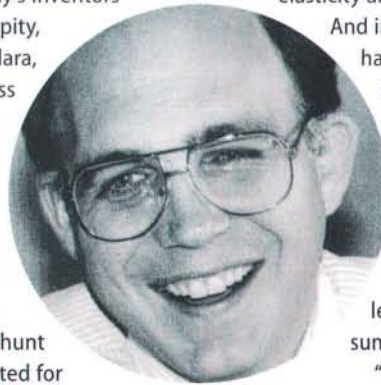
researchers to analyze hundreds of materials at a pop.

Schultz has high hopes for the technology, which could lead to new products like plastics with improved elasticity and brighter phosphors for pixel displays.

And industry is listening. So far, the company has attracted an impressive \$95 million in backing from German chemical giants Hoechst and Bayer AG, among others.

By the end of the year, Symyx hopes to develop a batch of new catalytic materials. Catalysts make the chemical biz tick, accelerating chemical reactions – like those that turn petroleum into plastic – without being consumed by reactions themselves.

"The tech barrier for Symyx's work is high," says Winifred Halsey, a combinatorial science analyst for TechKnowledge Associates. "You have to be good at both chemistry and materials engineering, but Symyx is ahead of the curve." – *David Voss*



Human catalyst: Schultz.



e-business Accelerator

Name:	Amir Khan
Job Description:	Help companies exceed business goals by planning, designing and implementing e-business solutions.
Experience:	Increased information sharing at a global drug company by combining multiple e-mail systems into a single, secure intranet for 6,000 employees.
Quote:	"Business as usual? No such thing."
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The Taste of 2000

You've purchased a cabin in the woods, equipped with a generator and propane tanks – but what to buy for the pantry? Millennium III Foods (www.millennium3foods.com), based in Bozeman, Montana, has carved out a niche selling freeze-dried food in preconfigured packages of 64 delicacies shipped in 111 vacuum-sealed cans – all you need to satisfy a hungry appetite for an entire year. Prices start at \$1,595 per person, and according to CEO Carole Munson, the company is already selling about 1,200 “one-year units” each month. So how does the stuff taste? To find out, we cooked up some truly nouvelle cuisine in our subterranean shelter. – *Todd Lappin*

PEARLED BARLEY

WHOLE EGGS

SWEET CORN

TOMATO SAUCE
PASTE MIX

SCRAMBLED EGG
OMELETTE MIX

BUTTERMILK
PANCAKE MIX

ABC SOUP BLEND

DICED CARROTS

TACO UN-MEAT

PASSIONATE
PEACH DRINK

BEEF UN-MEAT

Survival Stir-Fry

chicken un-meat, green peas, peanut-butter powder, white rice

Peanut-butter powder is a millennial chef's dream. Mix it with a little water to create a thick, nutty spread. Add more water, and it is transformed into a robust sauce. For stir-fry, rehydrate some peas and chicken un-meat, and gently sauté in a pan. Toss with peanut sauce to coat, add a dash of Tabasco, then serve on a bed of rehydrated white rice. This Y2K sauce balances the bacon-like flavor of the faux fowl and recalls the richness of satay.

CHEESE BLEND

Bunker Breakfast

scrambled-egg powder, taco un-meat, chopped onions, hashbrowns

While allowing the other ingredients to rehydrate in hot water, combine egg powder with equal parts cold water. Fold in desired amount of taco un-meat and scramble in a hot skillet. In a separate pan, combine rehydrated hashbrown potatoes with chopped onions and sauté until lightly brown. Season for a zesty South-western-style breakfast – a tasty way to kick off a day patrolling the fenceline.

SMALL RED BEANS

9 GRAIN CRACKED
CEREAL MIX

BACON UN-MEAT

BUTTER POWDER

INSTANT
NONFAT MILK

CREAM SOUP/SAUCE
GRAVY BASE MIX

CHOPPED ONIONS

APPLESAUCE

HASHBROWNS

ILLUSTRATION: WILLIAM VULNER

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CHINESE SOFTWARE

Cool Battles, Circa 300 BC

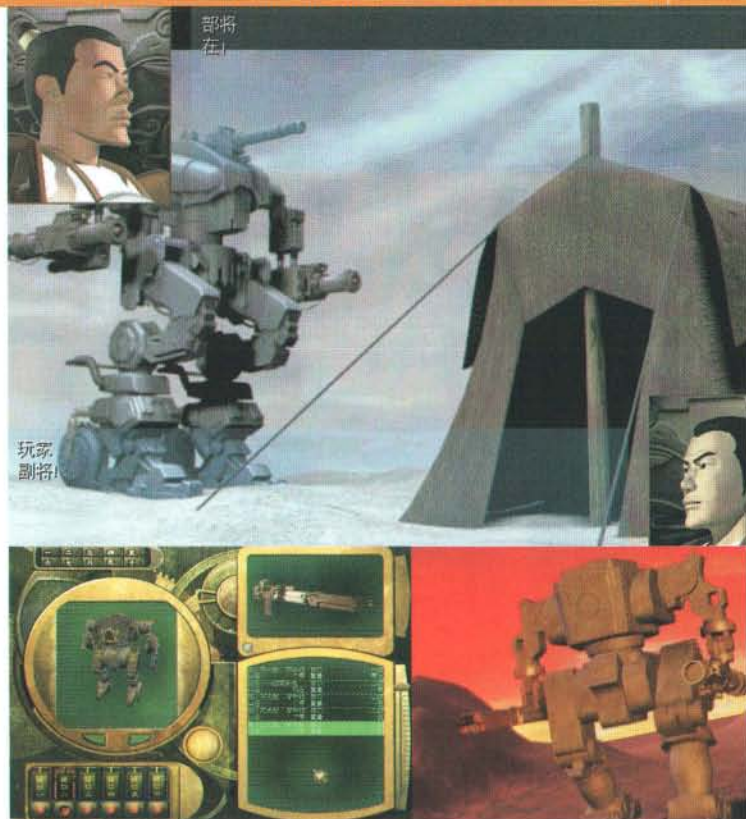
By the standards of mainstream Beijing, Bruce Hsu looks like a slacker. He speaks English with California breeziness and spends most of his time playing videogames. "I haven't had a shower in three days," he confesses while steering a People's Liberation Army tank across a decimated onscreen landscape.

But in 1997, Hsu created *Tianhuo* (Sky Chaos), China's best-selling domestic videogame.

This spring, with technical help from Intel in optimizing the software for use on the Pentium III chip, Hsu's Studio Pangaea will release *Dynasty*, a new game set in China's Warring States period (475-221 BC). "There are so many cool battles and slain heroes in Chinese history," Hsu says. "There's more to Chinese design than dragons, kung fu, and noodle-eating men."

Born in Beijing, Hsu attended high school in the US. First in San Jose, then in Denver, he learned to speak and code in English. Returning to China after graduation, he found himself unprepared to take China's college-entrance exams. And with that, a videogame start-up was born.

"Because of piracy, it's hard to make money writing software in China," Hsu admits; even with one of the country's best sellers, Pangaea has merely broken even. "Last year there were more than 10 game developers. Now there are six or seven." And while Hsu worries the government's crackdown on piracy actually hurts Chinese games – how else would they get distributed? – he believes demand for native code will win out: "Players here want Chinese-made games. It's part of the nationalism thing." – Carrie Kirby



"More than dragons and kung fu": Images from Hsu's *Dynasty*.



Hacks

Snow sledding

Windows 98

Tommy Hilfiger

Free DTV spectrum

Health insurance for people

Suitcase nukes

The Art of War

EarthLink

The Prince of Egypt



Strikebacks

Zorbing

98lite

Fubu

Taxable DTV services

Health insurance for pets

Anthrax envelopes

The 48 Laws of Power

Tachyon

Princess Mononoke

FIBER OPTICS

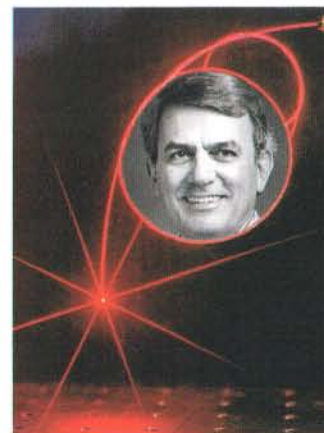
Very Local Loop

It's got all the sex appeal of Tupperware – and twice the convenience. University of Pennsylvania physics professor Anthony Garito will soon have you snaking *plastic* fiber-optic cable along your baseboards, just as you do with speaker wire today.

Glass cable consists of several thin fibers – only millimeters in diameter – inside a larger sleeve. Since light pulses travel faster toward the center than at the circumference, the fiber is specially engineered to ensure data arrives at its destination at one time. Plastic fiber, long dismissed by industry, has tiny imperfections that scatter the light. Garito has found that over short distances, these blemishes slow down pulses and naturally compensate for the irregular speeds. And while plastic is still too

impure to send signals across oceans, its pliability makes it ideal for short distances – like those in the home and office.

Garito, now in talks with manufacturers, hopes the first products will get to market by early 2000. "We'll be able to buy the stuff at RadioShack," he says, "and wire things up ourselves." – Michael Behar



Plasticman: Anthony Garito.

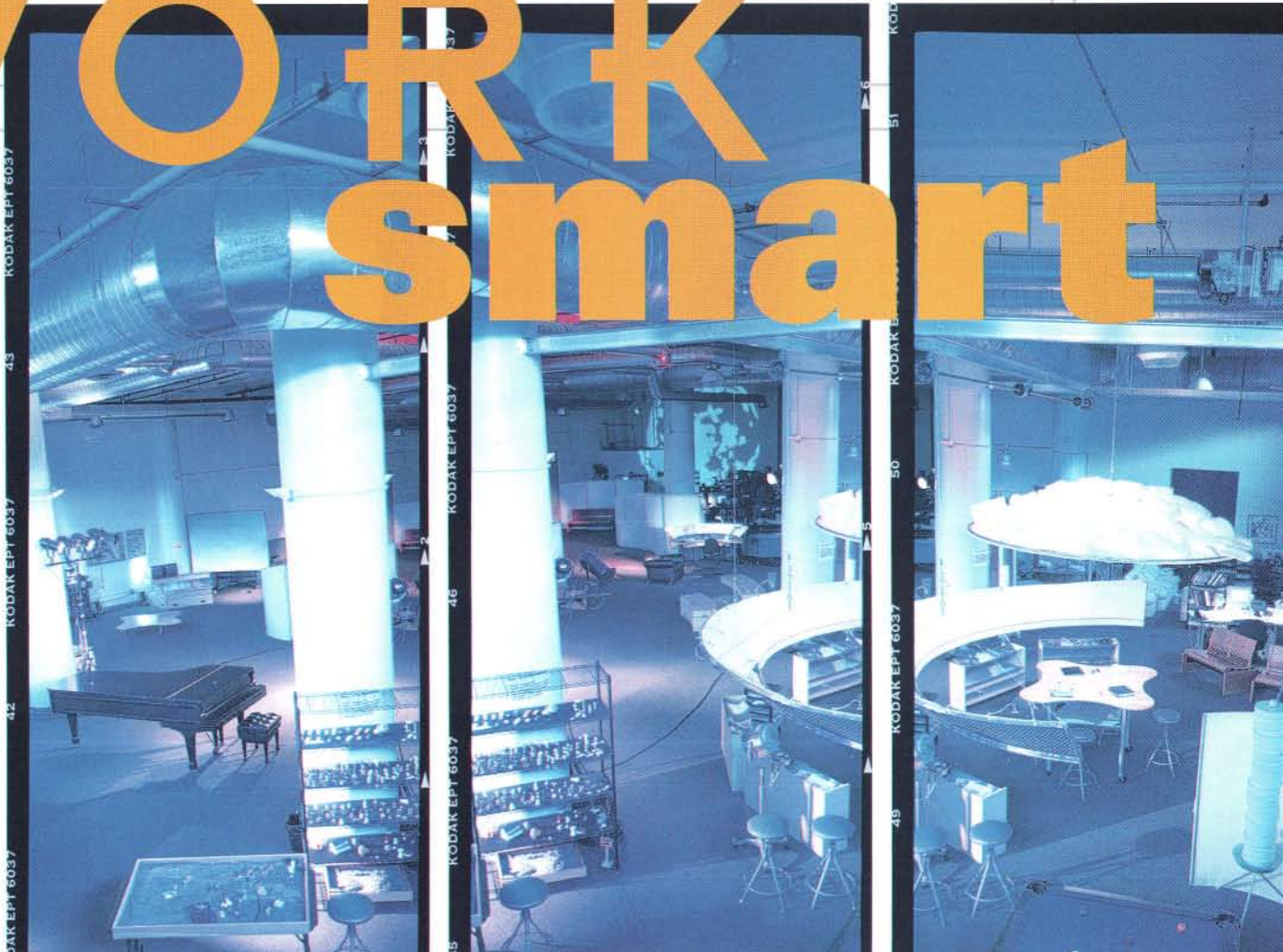


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WORK smart



Make no mistake—it's not your father's office anymore.

The Office of the New Millennium

Editor Renay Weissberger Fanelli of wire-to-wire, inc. (renay@wire-to-wire.com) is a marketing communications consultant based in the San Francisco Bay Area.

Photo: David Jenner

2000



Twenty-first century businesses operate in a competitive, technology-powered, global marketplace. The rapid pace of innovation demands constant vigilance to stay on top. Tie demanding, knowledge-based employees to ordinary desks in ordinary offices with ordinary equipment, and tomorrow they'll be working for the competition.

Business success in the new economy requires building a cutting-edge digital infrastructure—fast, high-capacity networks, powerful servers and PCs, and advanced telecommunications tools.

But rushing to spend millions of dollars on the latest IT upgrade is not a guarantee of success if employee satisfaction suffers. Businesses must also create highly mobile, highly flexible physical environments that embrace alternative work styles and nurture discerning workers.

■ This guide to the new millennium office defines the workplace of the future. It showcases office buildings that are environmentally friendly and efficient. It navigates office interiors that foster creativity and collaboration. It unveils technology that stimulates independent action, yet congregates the minds of employees around the globe into collective genius. ■ This definitive resource to the next-generation workplace has something for every determined and ambitious company—from the startup to the Fortune 500. Its insights into high design and high technology will put your business at a competitive advantage.

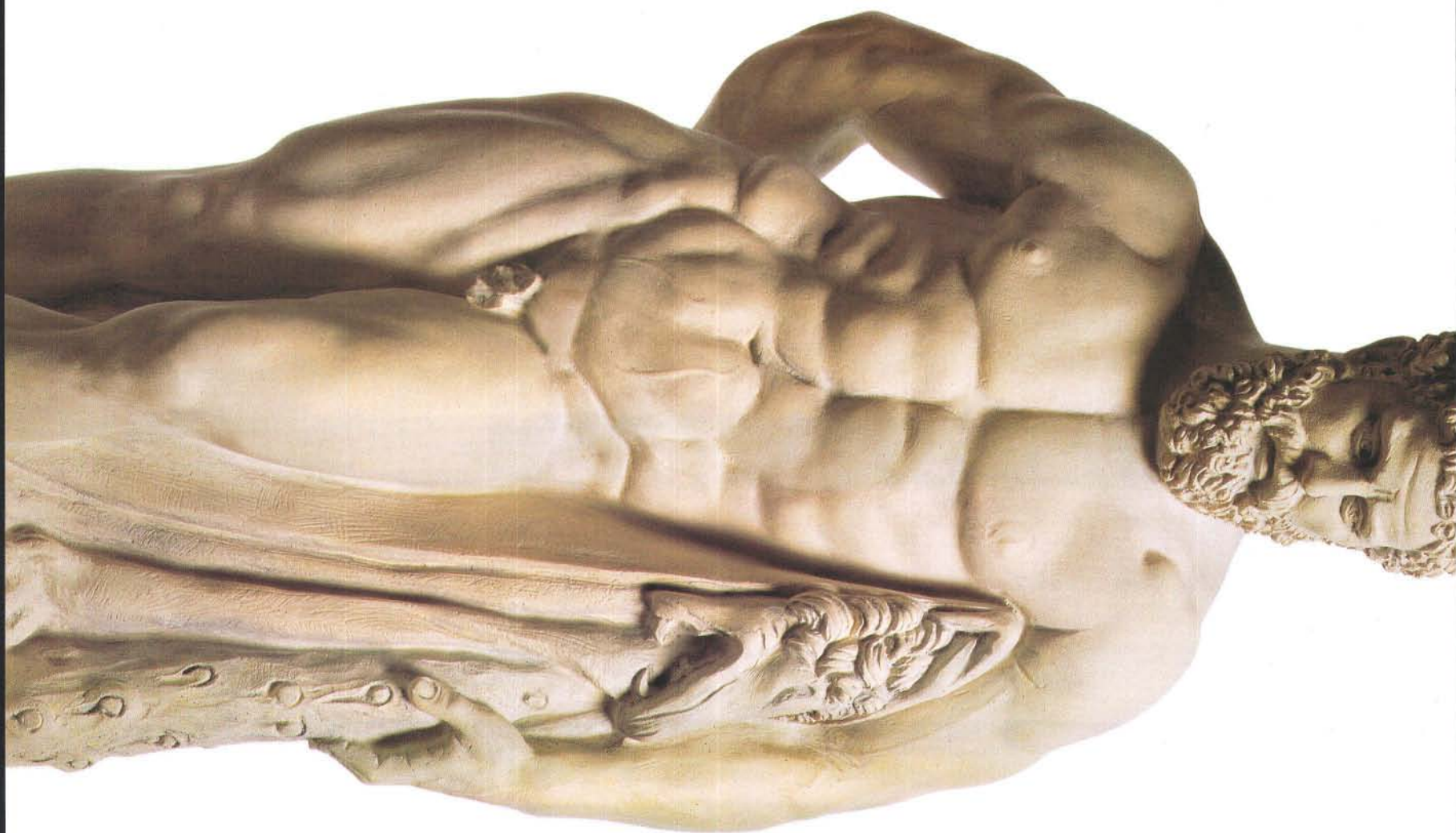
The Idea Factory, San Francisco

Meta Office: sandbox, piano, and knowledge ring

X I R C O M

Xircom breaks new ground in mobile connectivity with its family of patented RealPort™ Integrated PC Cards, the industry's first communications solutions with built-in connectors. There are no cables to lose or break and no pop-out jacks to snap and leave you stranded. Just plug your standard RJ-45 Ethernet or RJ-11 telephone cords directly into this Integrated PC Card and you're ready to access information from virtually anywhere. The RealPort Integrated PC Card offers increased productivity with the lowest cost of ownership by reducing support calls and user downtime, as well as eliminating costly cable replacements. Mobile communications has never been more easy, robust or reliable.





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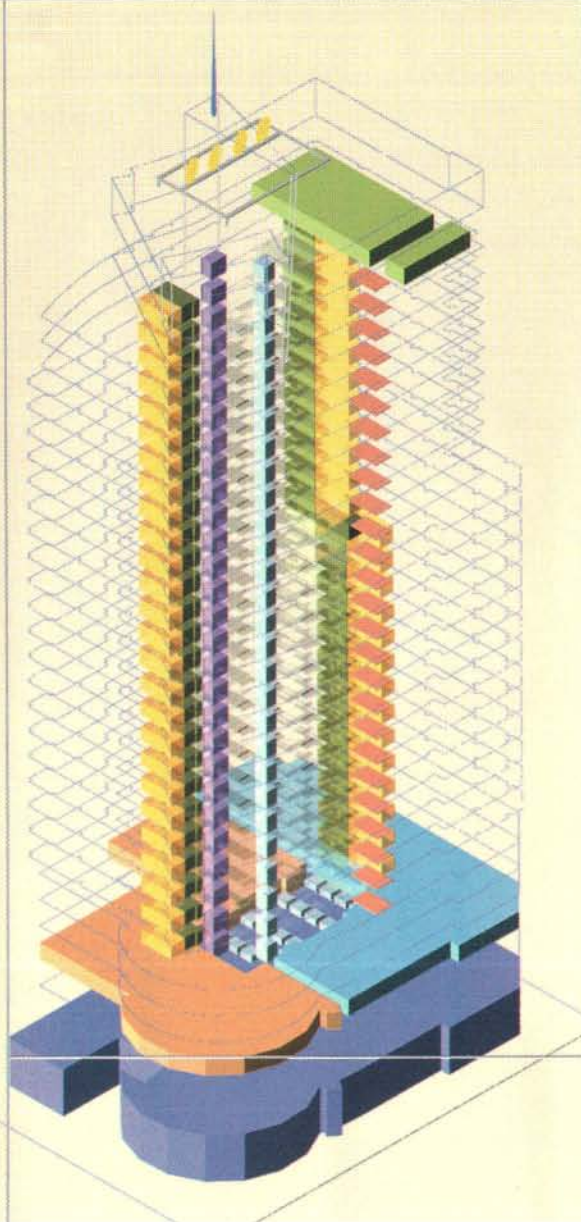
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**Tower of Power**

Reuters's central nervous system in Times Square

THE SMART BUILDING

What does the future workplace look like? Smart buildings that integrate the latest technologies to enhance efficiency, lower operating costs and promote cooperative work environments are the backbone of today's smart businesses.

"If you don't have an adequate technology platform built into the fabric of your office, you can't compete," says John Gilbert, chief operating officer of Rudin Management Co., a New York real estate developer.

Gilbert should know. Right now, his company is building a 30-story headquarters in the heart of Manhattan for Reuters, the financial news and information service. The building will be able to support the heaviest imaginable telecommunications load: communication conduits will be integrated within its framework; copper and fiber optic cables will ring its interior; and advanced satellite and microwave dishes will send and receive signals from its roof. Reuters (and the building's other tenants) will be able to connect to a vast menu of voice, data and Internet systems, allowing businesses to select providers most compatible with their internal operations.

Being green is a goal of a smart building. Energy efficiency is a must. In the new Reuters building, large windows and skylights will let sunlight into interior spaces, providing natural light and reducing energy costs. Thermal building materials will insulate outside walls so efficiently that heat generated by people and machines will be sufficient to maintain the proper temperature, even on the coldest days. Both gas and electric cooling units will be deployed and turned on or off depending on which fuel is least expensive. Rudin is also considering the use of non-polluting energy generators, such as fuel cells and photovoltaic panels, to generate electricity and heat water.

Some companies are enlisting Mother Nature directly to "green" their buildings. Clothing retailer Gap Inc., planted indigenous grasses on the roof of its San Bruno, California headquarters. The native grass works as an energy-saving thermal barrier, and it needs little maintenance and no irrigation.

Advances in telecommunications have transformed every airplane seat, conference room and dining room table into a "virtual" office. Yet, for a majority of businesses, human interaction is still key. And that interaction continues to take place within an office building. Smart businesses are not occupying just any office, but comfortable buildings. Intense and dedicated knowledge workers need places for on-site R&R. Most high-tech companies wouldn't be caught dead without a place for a pool table or video games to let highly creative employees recharge their batteries. Nor would they go without a café where people can relax and swap ideas.

Sprint Corporation takes the comfort concept seriously. At the company's headquarters, under construction in Overland Park, Kansas, employees will be

POLYCOM

Polycom®, the number one supplier of videoconferencing equipment, continues to set the global standard for high-performance videoconferencing with the ViewStation™ product line. Available in several models offering video performance from 128kbps up to 768kbps full motion video, ViewStation incorporates a number of unique innovations that set it apart from any other videoconferencing system on the market today. Polycom's latest videoconferencing system, the ViewStation™ MP (\$11,999), integrates a multipoint control unit to enable users to connect with up to three other locations, for high-quality multipoint videoconferences at the touch of a button. The ViewStation product line includes voice-activated camera tracking, an integrated presentation system and the industry's first implementation of an embedded Web server as standard features.



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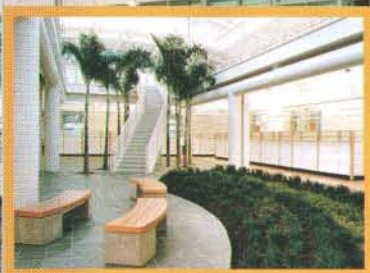
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photos: Mark Luthringer

Gap Inc.'s new office building

Its undulating grass roof is designed to evoke San Bruno's rolling hills.

able to use a fitness center, a daycare facility, an outdoor amphitheater, jogging trails and an 8-acre lake.

"In a world where knowledge is capital, the importance of providing for the employee's individual comfort, creativity and control is paramount," says David Gottfried, the founder of the U.S. Green Building Council and the president of Gottfried Technology Inc., a San Francisco-based development consulting firm. "Good building performance correlates directly with increased productivity and decreased absenteeism."

OPEN FOR BUSINESS

What takes place within the physical structure—how employees work together—will determine whether a company thrives or merely survives.

"The speed of innovation is so fast that the building interior must be flexible," says Gottfried. "Workers must be able to set up their workspace anywhere within the building shell."

Companies such as Hewlett Packard, for instance, have built open offices promoting team building and shared space. Workers maintain a "home base" for their computers and personal files, which are arranged in pods to promote communication among team members. When a solo effort is required, HP workers migrate to "personal harbors" to concentrate and problem-solve in private.

At The Idea Factory, a leading facilitator of corporate innovation, their space flows as freely as the ideas. John Kao, founder of the San Francisco-based consulting agency, explains that the physical environment can stimulate thought and engender innovation. Says Kao, "Our facility, which borrows elements from many creative disciplines including design, theater and film, gives us permission to explore a wide variety of experiences and test new ideas." He adds, "Every 30 days, the factory's environment undergoes a complete metamorphosis."

Kao is also collaborating on the design and development of objects that support corporate innovation. On the factory's floor are several prototypes, including the "knowledge ring," a semi-circular series of pushpin and whiteboard surfaces designed to provide a visible and visual repository for ideas.

Other companies are designing solutions that flatten the office's traditional interior hierarchy. Employees are being placed by function rather than title, supporting interaction among team members and eschewing status-laden floors or offices.

Andersen Consulting, a management and information technology consulting firm, no longer assigns its consultants specific offices. Workers now select from a series of five space options—ranging from "touch-down" space, small enclosed areas, to open work cells to large conference rooms—and reserve seating to complement the day's agenda. Upon arriving at the office, consultants log on to a computerized kiosk, and a personalized seating itinerary is delivered.

POLYCOM

Polycom has established itself as the global audioconferencing leader with its SoundStation conference phone product family, including such award-winning products as SoundStation® (\$499), SoundStation Premier® (\$999), SoundStation Premier Satellite® (\$1,599) and SoundPoint® (\$249-\$299).

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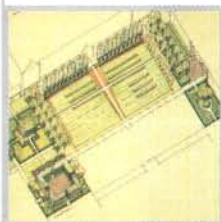
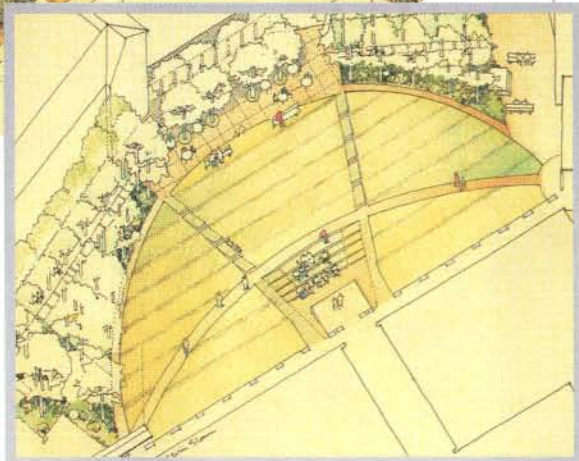
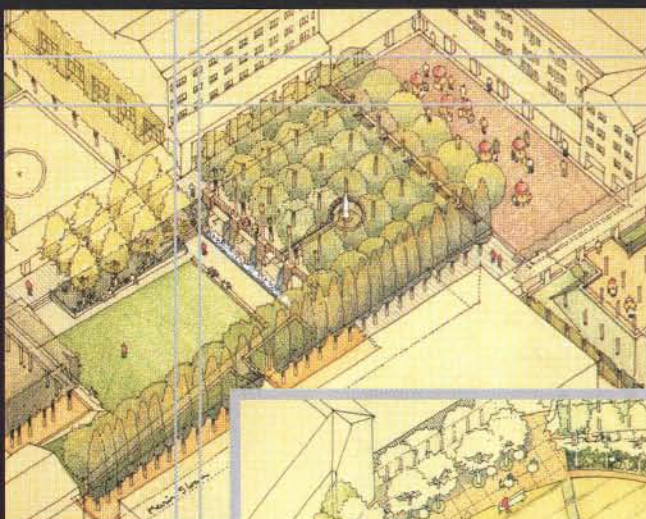
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**Sprint Ahead**

The seven mile jogging track and amphitheater at Sprint Corporation's newest campus.

The nomadic nature of the consulting profession eased the transition from designated offices to generic ones. "Still," says Gabrielle Campbell, director of facilities and location services at Andersen, "when you take something away, it's important to give something back. What we've opted to offer is service." Like concierges in the finest hotels, Andersen's service personnel offer quick, quality service, from delivering favorite lunches to procuring must-have office supplies to solving frustrating technological glitches.

When the global nature of business keeps workers apart, technology brings them together. Polycom, a leading developer of videoconferencing, data-conferencing and audioconferencing solutions, enhances collaboration by providing the easiest and most innovative ways to communicate, as well as interactively share information at a distance.

In the next millennium, the most successful companies will be those that capitalize on collaborative rather than individual efforts. "Tomorrow's workplace will be different, occupied by organizations that encourage innovation and creativity by putting their people into environments that are less predictable and permanent, engendering team work and instilling the benefits of change and uncertainty," writes workplace innovation researcher Philip Ross in a recent edition of *alt.office Journal*.

Translation? The traditional office is history.

THE NET WORKS

New millennium companies are benefiting from the wisdom of an old-fashioned assumption: physical proximity promotes interaction. But interfacing in today's far-flung, fast-paced business environment requires much more.

To stay connected, businesses need an electronic network, a powerful, sensory-rich communications backbone. Communications companies are quickly developing strategies and products to support high-speed, high-capacity networks. Teligent, the upstart wireless telecommunications company, has become the darling of Wall Street for its focus on providing small and medium-sized businesses with local, long distance, high-speed data and Internet services for a flat monthly rate. Available in 15 cities so far, the Teligent network eschews traditional copper wires and fiber optic cables for digital radio signals picked up by a 12-inch microwave antenna placed on the business's roof.

Extending the use of Internet-based networks within the company (intranets) and outside the company (extranets) is crucial as companies compete in a global economy.

The Boeing Company, the world's largest airplane manufacturer, uses intranets to allow engineers in remote locations to work on the same project. Using advanced 3-D modeling software, the engineers can design "virtual" airplane

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Photo: Courtesy of Apple Computer, Inc.

**Above: Eye Candy, Brain Candy**

Apple introduces iMac's colors of the season

Below: Cubists

Intel's new concept PCs are a work of art

parts that reside in one living, constantly updated document on the network. This eliminates the need to transmit 2-D drawings and notes back and forth.

Julien J. Studley, Inc., a real estate services firm, set up an extranet to assist Astra Pharmaceuticals, L.P. in managing the real estate needs of 23 field offices around the country. Under a recent restructuring, Astra, an international pharmaceutical company based in Sweden, combined two U.S. sales entities. With the newly appointed director of corporate real estate traversing a wide territory, Astra needed a central repository where information could be accessed at any time from any place. "The extranet provides all parties in the transactions immediate access to data and documentation," says Hether Smith, senior vice president and branch manager of Studley's Philadelphia office. "It eliminates the need for the client to lug heavy files, and allows us to run a 7-day-a-week, 24-hour-a-day operation. Approvals and scheduling are done electronically, and financial documents, project timelines and space plans can be viewed and reviewed online."

TOOLS OF THE TRADE

What else do workers need now? Hard-driving hardware. To succeed, employees need the right tools. Futurists may be predicting a post-PC world where networked intelligent chips will be imbedded in everything from office chairs to coffee makers, but at least in the near future, hardware in its current incarnation isn't going anywhere.

The tools of the 21st century office are improving, allowing companies to push the envelope of productivity. Tools are smaller, smarter, simpler to use, more powerful, more intelligent, even more colorful.

Take the old beige box, for instance, otherwise known as the desktop computer. Apple reversed its fortune by packaging its latest iMac in a bulbous, translucent blue skin. Emboldened by its success, Apple now offers the machine in a rainbow of colors.

New shades and shapes appeal to consumers, and PC makers are taking notice. Intel is using its considerable influence as a chip maker to push the PC design envelope. Last fall, it showed off a series of concept PCs in silver and orange that looked like pyramids and cubes.

These new machines are more than just pretty on the outside. They pack a heavy computing punch and are easier to use. Processors running at up to 500 MHz are already on the market, and it won't surprise anyone to see 1 GHz machines unveiled soon. Such processing speed makes quick work of massive data files, video and high-bandwidth information streaming over the Web. Serial and parallel ports—the sometimes sluggish interfaces between computers and peripherals—are being replaced by universal serial bus ports that can transmit data 100 times faster.

AGFA

Two new digital cameras, the ePhoto CL30 and the ePhoto CL50 join Agfa's award-winning ePhoto lineup. Both cameras produce print-quality, megapixel photographs, and let the user choose to use either the traditional optical viewfinder or the LCD screen for framing shots. The ePhoto CL30 is among the first cameras to feature USB compatibility for fast and easy image downloading. The ePhoto CL50 provides a full range of image-enhancing features from sound annotation to panoramic and burst modes, along with the SunCatcher™ for conserving batteries and enhancing the LCD screen in sunlit conditions.

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Then there's the emergence of flat panel displays, the supermodels of the computer monitor world. Svelte, sleek and flaunting picture-perfect pixels, the new desktop versions of laptop screens are making a strong case for turning bulky CRT monitors into aquariums.

The fastest-growing segment of the PC world, the sub-\$1,000 machine, is delivering a 300 MHz processor, 64 MB of memory and a 4GB hard drive, minimum.

Digital cameras are becoming another must-have office tool. The line of ePhoto digital cameras made by Agfa connects to a Mac or PC via a serial cable. Images can be quickly and easily downloaded, organized and edited for a wide variety of applications. As the pace of business accelerates, capturing pictures digitally can save time and money.

The world of videoconferencing is rapidly evolving, too. Advances in technology and plummeting prices are making it easier for people to get together "virtually" from desktops that might be thousands of miles away. Systems range from small desktop applications to large video walls that allow participants to see each other as life-size images.

Companies such as 3M Visual Systems Division are capitalizing on expertise in productivity tools for the office to deliver low-cost, easy-to-use videoconferencing solutions to help ease potentially frustrating remote meetings.

Although they will never fully replace the need for face-to-face meetings, virtual meetings are being used increasingly when the logistics of bringing people together are too difficult. "It allows you to keep important people in place while moving information and communicating the facial expressions so important to human interaction," says Christine Perey, a California-based consultant and expert in multimedia communications.

HIT THE ROAD, JACK

John McCutcheon, vice president of marketing and international sales for Perclose, Inc., a maker of cardiovascular surgical instruments, can't wait to be liberated.

He's a road warrior and wants to live by the motto, "Work anywhere, anytime."

But right now his credo is, "Work anywhere, anytime—as long as you can find a phone line."

McCutcheon travels 125,000 miles a year. Armed with a notebook PC, a pager, a cell phone and a personal digital assistant, he travels regularly to Europe, Asia and Australia and across the United States.

Staying in touch with his home office in Menlo Park, California, however, is frustrating. "Email is vital. Unfortunately, what should be seamless is too often not, especially when I'm overseas," he says.

McCutcheon's emancipation is just around the corner.

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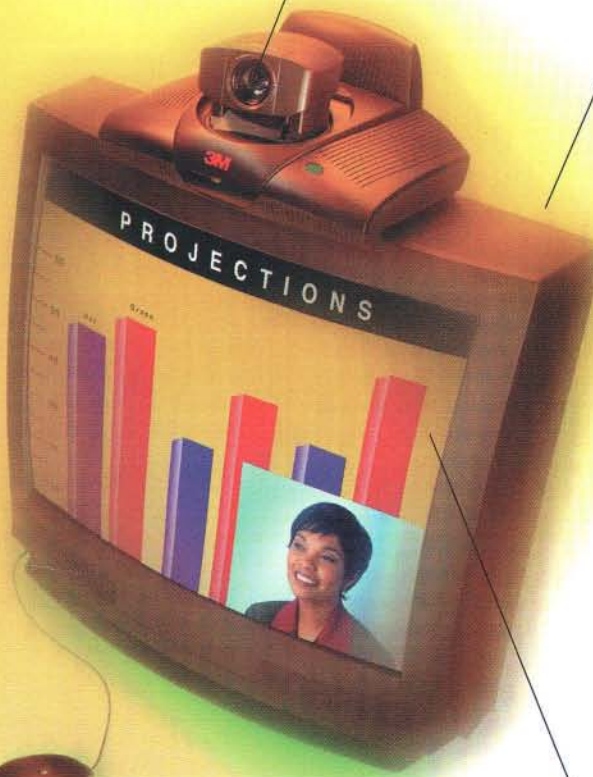
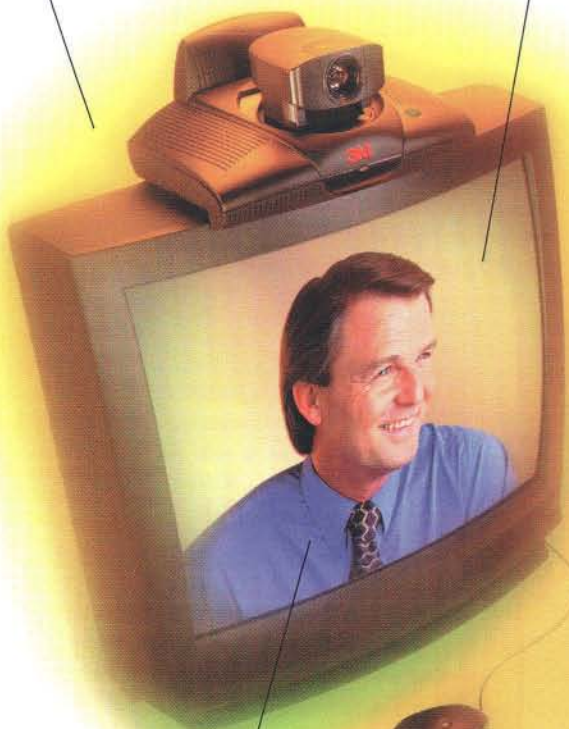
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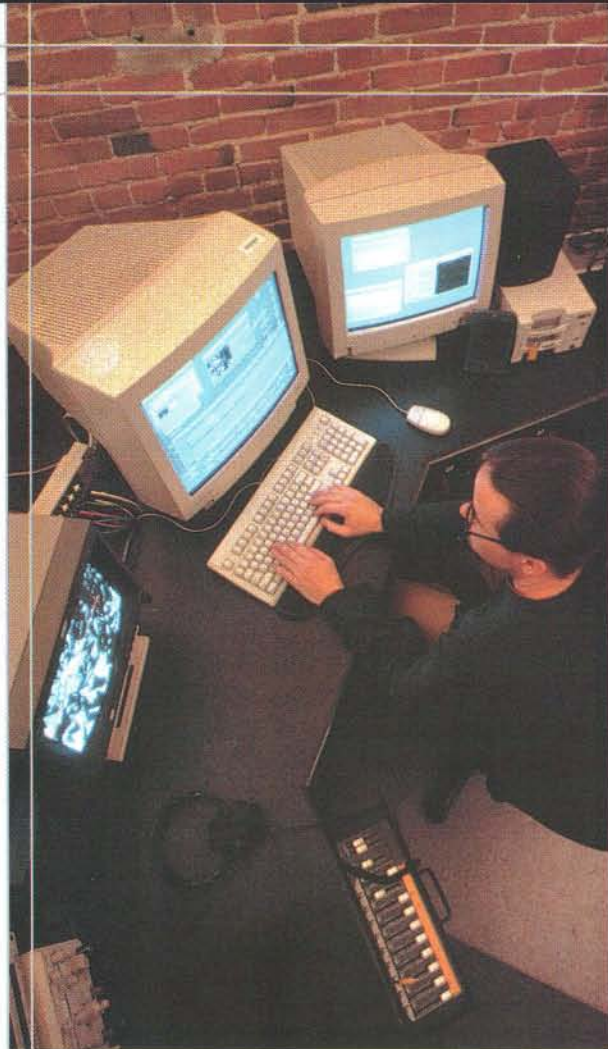


Photo: John Couch

SPECIAL ADVERTISING SECTION

Digital wireless data communications technology will free the 21st century road warrior. And its rollout and adoption are already underway. Today, digital wireless cellular service has modest applications for email and Internet access. But by 2000, those same wireless networks will let nomadic professionals everywhere access corporate networks at speeds approaching conventional land lines.

Nowadays, when road warriors aren't explorers searching for elusive phone lines, they're beasts of burden lugging around pounds of electronics. But soon the load will lighten, thanks to smaller, lighter, multipurpose tools.

The next generation of cell phones—dubbed digital "smart phones" or "screen phones"—have features that eliminate the need to carry a pager and a digital personal assistant.

For instance, wireless phone maker Qualcomm has licensed the Palm operating system to create the first combination digital phone and handheld digital assistant. The new pdQ smartphone looks much like a PalmPilot™ but with a foldout telephone keypad and antenna.

Another cell phone maker is already selling a portable satellite phone that weighs about two pounds and works anywhere in the world.

For those who are less concerned about globetrotting but still need to keep in constant touch with colleagues and clients in a limited area, several cell phones incorporate short-wave radio systems that let users to remain in contact without racking up expensive cell phone charges. Dave McClure, manager of the Internet Business Unit of Servinet Consulting Group, an Internet and e-commerce integrator, crisscrosses the Bay Area and Silicon Valley by car on a daily basis and finds that his short wave radio/cell phone, used like a beefed-up walkie-talkie, has replaced his pager. "I can ping one of my engineers or a key client and reach them immediately, or I can broadcast a message to a team of people in the field," he says.

McClure believes that eventually cell phones will decrease in size and be combined with voice recognition technology so that devoted users will wear them at all times, most likely as hearing aid-like devices implanted in the ear.

It's not difficult to see where this technology leads—the all-purpose "Internet appliance": a convergence of cell phone, pager and personal digital assistant into a single, web-enabled, mobile computer system.

"Firms are reaching the limits of what they can achieve in a PC-centric architecture," says Carl Howe, director of computing strategies at Forrester Research, a technology research firm. "Over the next five years, we expect to see companies forsake the 'PC for everything' approach. The simplicity, reliability and performance of Internet appliances will enable corporations to revamp their computing environment."

For now, however, the laptop rules. Laptop computers are getting smaller, faster and—most important to weary business travelers—lighter.

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The "virtual team" is on a fast and steady rise in business today – a trend driving an increasing demand for videoconferencing systems and the ability to connect these "virtual teams." 3M is in a unique position to meet this need on a global basis – leveraging its 30-year expertise in the meeting room with innovative videoconferencing solutions.

The four videoconferencing systems within the 3M Videoconferencing Systems VCS3000™ Series – 3M VCS3000, 3M VCS3100, 3M VCS3100 V.35 and 3M VCS3100 MP – feature the power of high-end room systems in a compact footprint and can be easily integrated into an existing information technology infrastructure. For additional information, visit www.3M.com/meetings or call 800-952-4059.



For those who would lug their desktop PCs on the road if weight was not an obstacle, power laptops offer the next best platform. Generally weighing under eight pounds, these machines pack 300 MHz processors, 64 MB memory and up to 8 GB hard drives. They also sport a multipurpose port for a DVD-ROM drive or extra batteries.

Then there are the pixie fairies of the portable world, the "ultraportables" or "subnotebooks." No bigger than your average magazine, these machines can turn the heads of even the most jaded road warrior. Most weigh under three pounds and are less than an inch thick.

In the "practically a laptop" category, Vadem's Clio is a buzz-worthy machine that earns serious wow points for its patented display screen capable of swiveling 360 degrees. In its standard screen position, the Clio looks like a conventional notebook computer. But swing the screen on top of the keyboard, and the Clio becomes a writing tablet complete with nifty handwriting recognition software. That's not all. Swing the Clio into an easel position, and the machine becomes a high-tech, flip-style presentation tool.

Of course, there's no such thing as a free lunch. "Any mobile device gets exposed to a lot of rough treatment on the road, and equipment that doesn't work means down time and high expenses. One of the most frequent breakages that occurs in mobile computing is the connection to the PC card modem or LAN," observes Phillip Redman, a wireless/mobile communications analyst with the Yankee Group, a technology research firm. One solution has been offered by Xircom, mobile connectivity experts headquartered in Thousand Oaks, Calif., and manufacturers of the RealPort™ Integrated PC Card. This incorporates built-in connectors and eliminates the issue of lost, broken or forgotten cables. Adds Redman, "Xircom's introduction of the RealPort is the first integrated system for mobile users that offers durability and simplicity for PC card connections."

Road warriors are getting a new arsenal of communication tools. They are about to be liberated.

STAY AT HOME, ZACK

In the United States, more than 11 million people telecommute. Like road warriors, they are eager to be freed.

Telecommuters may escape the tyranny of the office routine, but they're handcuffed by other things. Who for instance, can spend

all day on the Internet with a dial-up 56K modem? The sluggish speed will drive just about any at-home worker batty, especially those who are accustomed to surfing the Web on speedy T-1 lines leased by their companies.

The slow-go problem is being solved by broadband Internet access service. Telcos and cable companies are starting to offer the service, which enables a telecommuter to surf the Web at a speed up to 50 times faster than that of a dial-up modem. Plus, many manufacturers are outfitting their computers with digital modems compatible with DSL service or cable-based Internet service.

If they're not frustrated by the slowness of their communications equipment, telecommuters are terrorized by the quantity of electronic gear needed to run a home office. Here, too, technology is coming to the rescue. A flatbed scanner that also faxes, copies and edits photos. An ergonomically designed, handheld device that incorporates a mouse/tracking ball, microphone and loudspeaker. Space-saving, multipurpose machines are reducing home office congestion, and empowering the telecommuter to do more with less.

Technology is also helping executives overcome what are often considered the most significant roadblocks to telecommuting success—trust and accountability issues.

Stuart Loberg is the director of technology at Sparling, a Seattle-based firm that designs and builds intelligent communications systems. He's also a telecommuter. "The old management paradigm said employees need to be watched over to make sure they were getting the job done," he says. "Today, technology enables workers to be in better control of their time throughout the day. As a result, managers need to set performance goals, not attendance goals."

FASTEN YOUR SEATBELTS

The 21st century is speeding toward us, carrying with it a new concept for the American workplace. The new century office may be in a downtown office tower, a sweeping campus office park, a professional's home or an executive's luggage. Wherever it is, it'll be connected electronically to other new century offices around the world. It'll be equipped with custom computers, minielectronic devices and multipurpose machines. It'll be friendly to its workers and its environment. It'll flex with the workload and the work style. It'll be different with each passing day.

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WORK smart

The Pleasure Binge

In the Entertainment Economy,
all the world's a play station.

By Michael J. Wolf

You may not often find yourself musing about mainland China and Las Vegas at the same time, but I do. That's because in 1997, in China, the world's most vibrant national economy, employment grew by 4.1 percent – less than half the rate of the world's most vibrant urban economy, Las Vegas, Nevada. Not too surprising, really, when you consider that Las Vegas is a city devoted entirely to entertainment. And at the turn of the millennium – when a CNBC story on cybersex sends trading on the New York Stock Exchange into momentary free fall; when Citibank turns to Elton John as its chief marketing tool to reach a goal of 1 billion customers; when American consumers spend more on entertainment than they do on clothing or health care – it is now clear that entertainment is the chief catalyst of change in the globalized, brand-dominated consumer economy.

The convergence of computers and telecommunications is creating an endless appetite among consumers for entertainment content. Entertainment can connect us emotionally with products and draw our attention to one product message among tens of thousands competing for our attention. So pervasive is

the intrusion of entertainment into our daily lives that we have come to look for the “e-factor” in every aspect of life. We expect that we will be entertained constantly. Products and brands that deliver on this expectation succeed. Products that do not, disappear. Entertainment has, in a way, become the lingua franca of modern commerce, as indispensable as currency.

But entertainment qua entertainment is only part of the story. What's really significant is the way entertainment content has become a key differentiator in virtually every aspect of the broader consumer economy. From travel to supermarket shopping, from commercial banking to financial news, from fast foods to new autos, entertainment content shapes our ideas and our choices. The result is a world of commerce where the lines between entertainment and nonentertainment are increasingly blurred, and where the e-factor figures in virtually every product and service consumers buy.



Entertainment is the lingua franca of modern commerce, as indispensable as currency.

How did the entertainmentizing of the economy happen? Culture, demography, and technology are all pushing us toward one goal:

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extracting the last drop of fun out of every experience. The numbers back up this instinctive assessment. The rate of personal savings in the United States has declined to a 63-year low of 2.1 percent. Yet entertainment spending is at a high of 8.4 percent of total consumer expenditures. Even if you don't count consumer electronics – which means leaving

periods over the course of the week.

As a result, the 30-hour reservoir of free time once concentrated on the weekend is enjoyed in smaller parcels. We find ourselves with two hours before picking up the kids at soccer practice, so we stop in at Barnes & Noble. A business traveler might steal 10 minutes before leaving the hotel to check email

dening, flower arranging, or even riding a bicycle. You can now pay for the do-it-yourself kit, whether it's rose-pruning lessons, cooking, or instructional lovemaking tapes.

Consumers, already seasoned multitaskers in their professional lives, are increasingly looking to further maximize seemingly scarce leisure opportunities by seeking out products and services that include entertainment content as an additional part of their offering. The lure is the opportunity to make the most of that 30 hours of free time by combining entertainment with other activities, sometimes cannibalizing more "productive" time. Studies done using SurfWatch filtering software, for example, show that as much as 27 percent of corporate Web traffic is not business-related. Furthermore, an estimated 14.9 percent of employees who have Internet access have shopped online while at work. After all, as long as you are logged on to the company's server, why not check out an automotive site, participate in an online auction on eBay, or find the latest sports scores on ESPN.com?

In a culture that so values the productive and pleasurable uses of time, perceived waste is deadly. The apparent scarcity of free time and the necessity to plan for it has the effect of upping the ante for each entertainment decision. In a time-obsessed economy, a bad movie is more than a waste of time – it also represents a major opportunity cost in terms of the other fun you might have had. To limit those frustrating risks, consumers are now employing the same expert information resources and guidance tools in making entertainment decisions that business has long used for strategic decisionmaking. It does not require much behavior modification for an attorney who searches Lexis for case law to turn to Zagat's online restaurant guide to make a dining decision.

These changed perceptions and uses of time have provoked adults into treating fun not just as a reward but as an entitlement. They expect it to be part of the package, and

This piece is adapted from The Entertainment Economy: How Mega-Media Forces Are Transforming Our Lives, by Michael J. Wolf, to be published in March by Times Books/Random House.

Today, we see **our lives** the way **television** executives see their week, as a series of little boxes that **need to be filled**.

out TV sets and VCRs – entertainment is a \$480 billion industry in the US. Leisure, entertainment, recreation, pleasure – no matter what you call it, we have become a world of fun-focused consumers.

While the common perception is that we have less leisure than previous generations, studies show we have just as much spare time as folks had in the days of *Ozzie and Harriet* – approximately 30 hours a week. Nonetheless, increasingly, fun is being equated with time. A survey last year revealed that 36 percent of Valentine's Day gift givers were forgoing the traditional presents of chocolates and flowers and presenting their significant others with spa passes, catered meals, even vouchers for cleaning services. In other words, they were giving the gift of a good time, or, more important, the *free time* that allows one to have a good time.

This is part of a larger cultural shift in the perception of time. Not long ago, leisure implied big blocks of unallocated time – time you could use to work in the garden, go bird-watching, read a book, do nothing. But through the influence of *TV Guide*, the Filofax, the PC scheduler, and the PalmPilot, we have begun to conceptualize time in a very different way, seeing it not as a slow-moving river but as a highly segmented grid.

Concurrently, as time has become broken into variable-length blocks, it has become commoditized. Today, we see our lives the way television executives see their week, as a series of little boxes that need to be filled. We have become highly sophisticated self-schedulers. As TV programmers do, we increasingly seek to break our time into small periods and to distribute these variable-length

and local restaurant reviews on AOL. A teenager does geometry homework with a Natalie Imbruglia video on MTV as musical wallpaper. Even the larger blocks are shorter – today, more than half of all holiday trips are weekend trips, according to the Travel Industry Association of America. (This trend has not been lost on the airline and hotel industries, which have developed a plethora of two- and three-day vacation packages.)

The entertainment marketplace allows us to recapture some of the pleasure associated with free time by offering fun in big or small doses, as stand-alone fun, or as part of a more utilitarian activity. In the 1980s we all became masters at channel surfing. At the end of the 1990s, we are becoming "time surfers": a little here, a little there, keep it interesting, keep it moving. In the same way that nature abhors a vacuum, schedulers abhor an empty block. So we schedule activity for all of our time, dividing between (and sometimes double-scheduling) home and work life and our reservoir of that now anachronistic concept, free time.

And if time-shifting is inherent in the new marketplace, so is place-shifting; there's a higher premium than ever on portability. We increasingly expect entertainment devices to allow us to have access to fun anywhere and everywhere, even when we're driving, working, or exercising. Similarly, duration – how much of my precious time do I have to commit? – is more important than ever.

As we become accustomed to treating the enjoyment of free time as a commodity, we're not only spending money on videogames, movies, and theme parks, but on formerly low-cost or no-cost activities such as gar-

they feel shortchanged if they don't get it. In such a climate, enterprises have no choice but to include entertainment in their business offerings.

To understand the importance fun has in dictating otherwise serious decisions, look at the resurgence of Apple Computer.

After a series of management blunders, a history of corporate underperformance, and in the face of Microsoft's domination of the computer market, Apple remains the technology industry's most miraculous survivor. That's because its Macintosh introduced the notion of creativity and fun to the computer industry. Today, the company is not only surviving but thriving, thanks in large part to the brilliant launch of the iMac under the renewed leadership of Steve Jobs. Yes, the G3 chip is really fast. But one small word tipped the balance: fun.

Entertainment – as a pure form or as value added to other products – speaks directly to the emotions. Writ large, such consumption choices are already influencing the national and international economy. Consider what's happened to Los Angeles. As communism was crumbling overseas in 1988, the city and its environs, with 242,000 jobs in the aerospace industry, lived in dread of the post-Cold War peace fallout. Yet 10 years later, California officials estimate for every job lost in aerospace, the local economy gained two in entertainment – a sector that's experienced 83 percent growth since the end of the Cold War.

Nothing has been more symbolic of LA's transformation than the \$95 million conversion of a TRW defense plant into Raleigh Manhattan Beach Studios. Defense assembly lines have been replaced by 14 soundstages for film and video production. The annual net gain of this and other post-Cold War businesses in the local economy is an astounding \$20 billion.

On the other coast, New London, Connecticut, was once basically a one-company town that built submarines for the US Navy. Military downsizing led to the loss of 17,000 jobs – more than 10 percent of the labor force. No local economy can take that kind of hit and survive. Or so it was thought, before the opening of the Foxwoods Resort Casino and the Mohegan Sun casino on nearby Indian land. With the concentric circles of jobs spreading out from that entertainment epicenter, an otherwise crippling blow has been largely offset.

In New York City, the economy's entertainmentization is even more impressive, in both relative terms and absolute size. New York wasn't hit with a peace crisis. Instead, in the late 1980s it experienced a good old-fashioned stock market crash. That nose-dive, coupled with a rash of mergers and takeovers, led to drastic downsizing in Manhattan's mainstay financial and real estate industries. Yet only 10 years later, New York's hotels are full. Film and video crews tie up traffic in every borough. Tourists are flocking from all over the world to see the shows and sights, including a Times Square stripped of porn stores and revitalized in part by a \$60 million investment by Disney. In pure entertainment-production expenditures, this turnaround has pumped an extra \$6 billion annually into the local economy. Throw in tourism, which in New York is mostly about consuming entertainment in one form or another, and you have an \$11 billion bulge.

Of course, you might say that New York and Hollywood are hardly typical of the rest of the country. What's this entertainment economy doing in the heartland?

The answer is: transforming it. Burdened

in California, 214 stores are packaged in a facility with an indoor zoo, two ice rinks, and a motion-simulation theater. Where the average visitor spends just over an hour at a conventional mall, at Ontario Mills an average shopper lingers 3.5 hours.

While sociologists decry the demise of communities, these parking-lot neighborhoods of stores and entertainment centers are growing faster than any retail phenomenon in our history. The next step in this evolution is to put housing next to the stores and megaplexes and call it a small town – indeed, just as Disney has done with its prepackaged living environment, Celebration, Florida.

These multiplexes, megaplexes, and a few truly colossal gigaplexes have spilled over into their surrounding neighborhoods in ways few bond-issue-financed arts centers ever have. The opera, ballet, and concert halls of New York's Lincoln Center never engendered anything like the window shopping and nightlife that has come into Manhattan's Upper West Side since the Sony Theatres Lincoln Square megaplex went up nearby on 68th Street. Entertainmentization is also helping to revive the consumer economy in Harlem.

For every job **lost** in aerospace after the **Cold War's end**, California gained two in **entertainment**.

by overbuilding, conventional shopping malls – the very malls that previously killed the urban downtown – began dying. Fewer than 10 percent of Americans shop frequently at malls, down from 16 percent in 1987. Even bargain merchandise – the traditional consumer pull – was not enough. Whereas typical shoppers each made 2.6 trips per week to the mall in 1994, today they're showing up about 1.7 times every seven days.

Enter the megaplex-centered mall and the theme-park mall – America's newest downtowns. The Mall of America, in Bloomington, Minnesota, for instance, added an entertainment complex, a walk-through aquarium, and a 7-acre amusement park to lure shoppers. Attracting 40 million shoppers a year, it now hosts more visitors than Walt Disney World, Disneyland, and the Grand Canyon combined. At Ontario Mills, an outlet center

A nine-screen multiplex owned by Magic Johnson Theatres is part of a \$65 million redevelopment effort on 125th Street that will also include retail shops by Disney, HMV, Modell's, and Old Navy.

Declining urban areas outside the dynamic coastal environments are also being transformed by the entertainment economy. Ten years ago, the city of East Saint Louis, just across the Mississippi from Saint Louis, was a textbook case of Rust Belt decay: raw sewage in the streets, uncollected trash everywhere, and a bankrupt city government. The municipal debt was so extreme that when a resident won a judgment against the town, he was awarded the deed to one of the government's few tangible assets, City Hall.

With the arrival of the *Casino Queen* riverboat, this impoverished city of 42,000 added

1,200 jobs. More than 3 million people per year now visit East Saint Louis. The casino and associated taxes generate more than 50 percent of the town's operating budget, which includes a beefed-up police force that has helped cut the city's murder rate, at one time the highest in the nation. Obviously, movie theaters and casinos are not a panacea for declining social services, underfinanced schools, teenage pregnancy, and violent crime. But there is no doubt that more jobs, more goods in the stores, and more people enjoying themselves on the streets are all factors in improving the tax base and the general quality of life in areas where it was once assumed that the future held only despair.

The rest of the world is not far behind America's entertainment economy. Nothing in Las Vegas surpasses Melbourne, Australia's Crown Entertainment Complex; at 5.3 million square feet, it has the world's second-largest casino, a 500-room hotel, 25 restaurants, 40 bars, 3 nightclubs, and a 2,000-seat theater. Even more impressive is Malaysia's grandiloquently named Genting, City of Entertainment – a resort complex that attracted 10 million visitors last year. Gambling halls, convention facilities, golf courses, restaurants, and sports facilities all faithfully replicate the Vegas model of an adult theme park. Malaysian legislators have agreed to locate the entire national zoo within a three-wood's distance of Genting.

Elsewhere in the underscreened, undermanned, still-waiting-for-cable world, new ventures are starting on an almost hourly basis. In much the same way that America grew by pushing into new territory while the already domesticated territories consolidated into new cities, so the entertainment economy is settling in new territories around the world. In Bangkok, for example, the Major Cineplex Sukhumvit entertainment complex has eight screens, a bowling alley, fast-food restaurants, and the full range of book and music stores that you might find in an Omaha, Nebraska, multiplex mall – plus a soon-to-be-completed Imax dome simulator.

Paradoxically, while entertainment may be a growth sector in the new world economy, few major entertainment companies are highly – or even marginally – profitable.

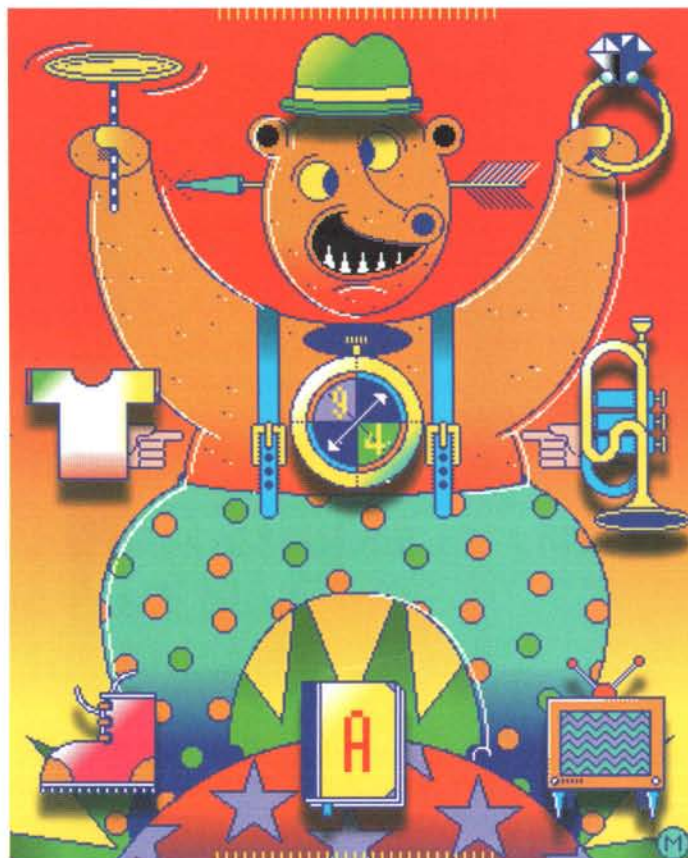
The most obvious reason is the glut of product in the face of consumers' fragmenting time. A battle is being waged for our attention. There are 10,000 more books published today than five years ago. Last year, nearly 30,000 albums were released by the major music labels and independents – of which fewer than 2 percent sold more than

The fragmentation engendered by new platforms has transformed the economics of industries whose revenue has traditionally derived from amassing eyeballs. Many savvy media watchers proclaimed the final *Seinfeld* episode the greatest sitcom of all time. Yet the finale's audience of 76.3 million viewers was decisively beaten by the 80.5 million who watched the last episode of *Cheers* in 1993 and pulverized by the 106 million viewers who tuned in for the concluding episode of *M*A*S*H* in 1983 – a decline of 30 million viewers, even as the total number of television households grew by 16 million.

Our current oversupplied marketplace is light-years from the days when ownership of media outlets was a sure thing. Twenty years ago, Warren Buffett, whose investments in media companies such as the Washington Post Company and Capital Cities/ABC helped him accumulate one of the century's great fortunes, compared a market-dominant newspaper to an unregulated toll bridge – the newspaper owner could raise advertising rates or subscriber fees as much as he or she wanted. Today, an inundated environment has rendered distribution monopolies virtually obsolete. Future growth, it is now clear, requires global expansion into less mature markets, diversification into other industries, or – most important of all – major hits.

A hit is more than an economic success: It also provides the cultural context in which people see themselves. Hits transform mere commerce into a consumerist culture statement. Their effect is cumulative and pervasive; the more hits an enterprise produces, the more its suppliers, distributors, and consumers trust it, thus easing its ability to gain continued market access.

The reliance on hits, in both entertainment and nonentertainment industries, has been the single most powerful change in the business environment. It has subjected enterprises long accustomed to steady, incremental growth to dramatic swings in earnings. The quest for hits has forced marketing to the forefront of business planning and added



50,000 copies. Close to 900 new magazines were launched just last year. In 10 years, the number of feature films released by the major motion picture studios has increased by almost 80 percent. Cable television, which only 20 years ago was just a way to deliver the major networks to outlying rural areas, today attracts a prime-time audience share approaching that of the big four broadcast networks – largely because the average cable TV viewer has access to 50 channels, up from only four or five per household two decades ago. Twenty-five percent of American households now have Internet access, and portals such as Yahoo! are creating a burgeoning new category of competition.

an *entertainment cycle* to the *business cycle*, in the process ratcheting up consumer expectations and competitive risks. Equally important, hits also imply the existence of flops, forcing traditional businesses and their executives to open themselves to the insecurities of Hollywood studios.

In such an environment, businesses will grow more quickly. They will die more quickly, too. I doubt we'll ever again see new restaurant chains like McDonald's, with 30-year category leadership. Nothing could better prove that point than the swift rise and equally rapid demise of theme restaurants such as Planet Hollywood and Rainforest Cafe. Similarly, Nike has overswooshed the world, and now it's no longer cool to wear its logo on your shoes, shirt, and hat – evidenced by its 51 percent drop in earnings during the second quarter of this past year.

In entertainment, losing is the norm. Most movies lose money. Most television shows never make it past their pilot. Most books are quickly remaindered. Entertainment is a portfolio industry in which some properties perform extraordinarily, but most don't perform at all. To expect companies to escape the new exigencies of doing business in the entertainment marketplace is like hoping that banks will go back to barter.

Is there any rationale to entertainment as business? Only if you look at entertainment properties like an investment portfolio. A well-considered stock portfolio is not a crapshoot. Rather, it's a collection of investments, some riskier than others, but all based on rational expectations of future value based on calculations of past performance. A variation on value investing also exists in entertainment. It boils down to this maxim: Bet on the talent.

Throughout the entertainment economy, there's been a power shift away from fast-disappearing distribution monopolies and toward the talent. Things have changed considerably from the days when Alfred Hitchcock imperiously observed, "I didn't say all actors are cattle. I said actors should be *treated* like cattle." Today, at the critical point where content connects with audience, celebrity is the indispensable mediator – and the only universal currency.

In this environment, brands are also celebrities. Successful businesses need celebrity



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brands to bring consumers through the door. These stars attract the attention not only of time-starved consumers, but of space-constrained retailers who are seeking whatever edge they can to raise their own thin profit margins. The star might be someone like George Clooney or Donna Karan, or it might be the Intel sticker on your PC.

The increased importance of dominant brands is shifting investment patterns throughout the economy, putting a new emphasis on Hollywood-style marketing and promotion campaigns in industries where expenditures used to be smaller and subject to longer-term budgeting.

Back in 1990, Alfred Zeien, who eventually became CEO of Gillette, came up with a then-gargantuan \$175 million marketing budget for a new razor, the Sensor. Movie-like prelaunch teaser commercials on the Super Bowl broadcast kicked off an advertising and marketing blitz. Right away, the product grabbed 9 percent of the domestic market, which doubled in the next year and racked up sales in the first five years of more than \$1.2 billion.

Like any hit, the Sensor began to run its

course. It was time for a sequel. Zeien returned to the market in 1998 with an unheard-of \$300 million ad and promotional campaign for the Mach3. Its name fairly shouted its concept: high performance. When the product was launched, the Dow Jones News Service wrote, "Everyone knows that Hollywood moguls have mastered the art of creating a buzz in the media. But can anything approaching that kind of buzz be generated for something much more mundane than a movie? Judging by Gillette's recent razzmatazz introduction of the Mach3, the answer appears to be yes."

Zeien's role in nurturing and launching the Sensor and the Mach3 underscores the unfamiliar role in which many senior business executives are now cast: mogul.

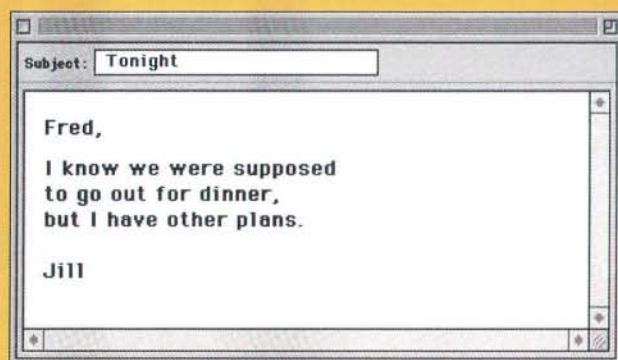
A hundred years ago, industrialists and financiers symbolized their age: the Carnegies, the Mellons, the Rockefellers. Today, Ted Turner, Sumner Redstone, Oprah Winfrey, and Rupert Murdoch are the businesspeople who capture the headlines and the popular imagination. They are the conquistadors of modern business. In the same way that staking out claims to huge areas of the

globe created great wealth in the past, equally great wealth is coming with their conquest of the emotions, the interest, and the allegiance of the global audience. More than ever, companies – all companies – need nimble, decisive leaders who can about-face in a rapidly changing environment. Egotistical, focused, controlling, deeply intuitive, and undaunted by failure, moguls are the absolute – and necessary – monarchs of the entertainment economy.

But a modern mogul, at the top of a corporate hierarchy, cannot alone assure success. As consumer businesses come to be differentiated by how effectively they include the e-factor, their fortunes will rise or fall based on their ability to harness creativity at all levels of the organization – in brand development, product replenishment, design, marketing, and communications. Adding effective entertainment content is not something that is accomplished merely because a CEO wants it. Rather, it is a chimerical, hard-to-define quality. Those who can contribute to its creation must be sought out, nurtured, and rewarded.

This is easy to understand but hard to do.

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At successful companies, it's a 24/7 operation. Consider Gap. It is one of this era's star brands. Gap connotes comfortable and casual. Gap is cool. And Gap creates a new product line every six to eight weeks. Reinventing its offering with this frequency – the equivalent of a première every month and a half – puts tremendous pressure on its designers, window dressers, copywriters, and display architects to come up with clothes, presentations, and a sensibility that connects with the public.

Swatch also constantly introduces new styles. When Swatches first hit the market, they caught on because they were cheap, functional, and beautifully designed. Now people are moving to their third, fourth, and fifth Swatches. This calls for fresh colors, new shapes, new features, innovative designs. Likewise, doll-crazed little girls are never happy with one Barbie; they need three or four. That's three or four different wardrobe ensembles and sets of accessories, too.

Of course, it takes creative talent, up and down the line, to drive success in the entertainment economy. This is a little scary for businesspeople who are accustomed to mak-

ing their decisions on the basis of spreadsheet analyses. There is no spreadsheet that can predict if the public will prefer one new color over another, one song over another, one film over another, one car design over another. Successful companies will be the ones that create talent-friendly environments.

Ted Turner, Oprah Winfrey – they are the **conquistadors** of modern business.

But if the human imagination is still the primary asset, it will never again create entertainment merely as an indulgence or an extravagance. Indeed, the critical difference between the development of entertainment in such potentially enormous markets as China or India and in the United States is that, in America, entertainment began as a luxury, something that required a lot of discretionary income before people would make purchases of TVs, VCRs, and computers. In the developing world, these items are

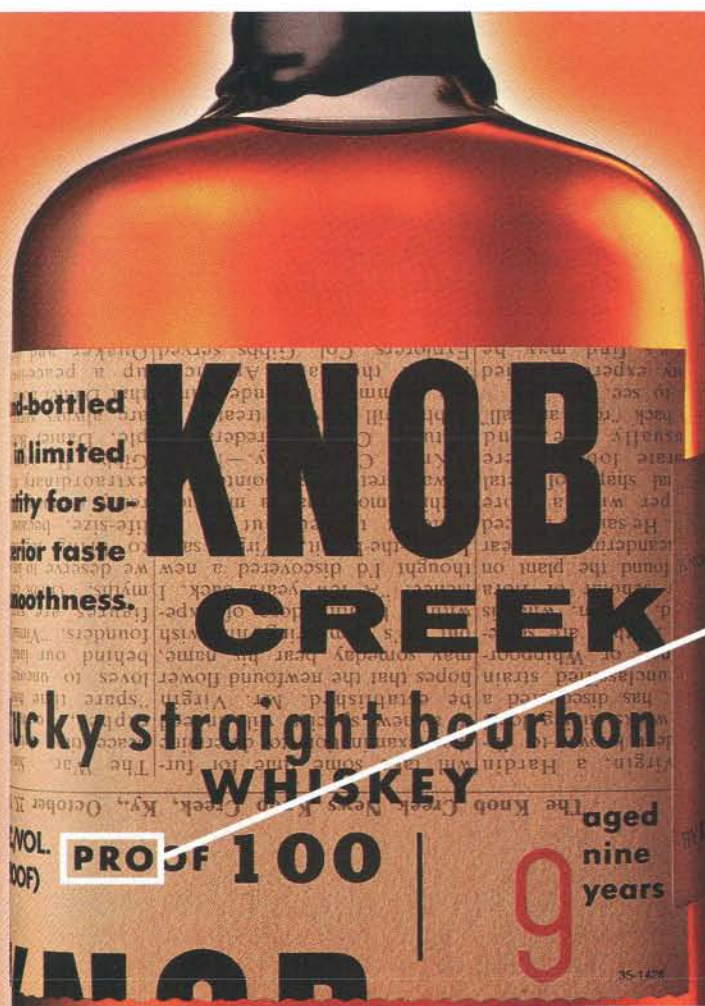
viewed not as luxuries but rather as necessities for entering the consumer class to which all of the world's masses aspire. Thus, the pace of economic entertainmentization is greatly accelerated.

Here is a number that never ceases to intrigue me. The Chinese like to take pic-

tures. But the average mainland Chinese household shoots only about half a roll of film a year. If everybody in China who now has a roll of film in a camera finished it and started a new roll this year, worldwide sales of Kodak film could double.

It gives you an idea of what's waiting around the corner. ■ ■ ■

Michael J. Wolf is the founder and senior partner of the Media and Entertainment Group at Booz-Allen & Hamilton.



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Order in the Court

Microsoft may be on trial in Washington, but not in LA.
Among the judges and clerks of California,
Gates is doing just what he does best:
getting on the desktop.

By Kaitlin Quistgaard

There are 70 million archived pages in the City of Angels, and somebody has to file and retrieve each one. By hand.

"We are drowning in paper," says Tony Antenoracruz, the regional administrator of special court operations at the Los Angeles County Superior Court, the nation's busiest, as he wanders through what passes for a colossal filing cabinet. Red, blue, green, and yellow, the wrinkled tabs labeling 400,000 active cases in one 8,800-square-foot room give a hint of how tricky it might be to actually locate what you're looking for. Files bulge from open shelves towering almost to the ceiling; the court staffers combing through them resemble elves lost in the stacks of a giant's library. Next door, aisles of files fill another 5,500 square feet. Across the street sit another 7 million files. It would seem to take something shy of an ongoing miracle to avoid having every last page misplaced and irretrievable just when a judge needs them.

So it's easy to see why Antenoracruz and his superiors were so receptive when a \$14 billion software titan in Redmond, Washington, called to proffer a solution.

The story of how Microsoft – entering late into the market for a mundane activity known as electronic filing,

and extending no more than its pinkie to the legal market – swept up the business of the world's largest court and with it the potential to control the future of legal information nationwide is hardly singular. The software maker is superimposing the same plotline on 17 chosen industries, including health care, manufacturing, and real estate. Even as the rest of the technology industry waits to see if government antitrust hawks can slow the company down, Redmond is still busy expanding – market by market by market.

Most of the courts in the United States are trapped in an industrial-age hell, where weary public-

sector employees toil in fields of files, producing bumper crops of headaches. One civil court division of one LA district alone receives an average of 4,000 documents each day – some delivered by span-dex-clad bicycle messengers, most by a sour-faced, envelope-clutching public. Its 100 clerical workers must file them, but not before typing the filings into an antiquated database. Then they must rifle through the equivalent of 125 million unbound copies of *Crime and Punishment* to find a case whenever someone asks for one.

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least 17,000 times over – the number of state trial courts in the United States. That process and archival maintenance are time-consuming and enervating, costing US courts an estimated \$1 billion per year. Each year, some 370 million documents are filed in US state and federal courts. Even the common personal injury suit following a car accident generates reams of official paper. First you file a “complaint” alleging that you’ve suffered and the other driver is at fault, followed by a “proof of service” showing that you served the defendant a summons. An “answer” is then filed laying out the groundwork for the defense, and maybe a “cross-complaint” alleging that you are at fault.

With e-filing, **Microsoft** could have avoided renting a **moving truck** to haul all its **documents** to Washington.

Each filing is due by a certain date, with penalties for lateness – hence the long courthouse lines every afternoon. If the case isn’t settled, both sides’ attorneys will file motions to exclude certain evidence, and the court will file documents detailing the trial schedule. The minutes of the trial itself are entered into the court’s file, along with the evidence – transcripts of depositions, exhibits, et cetera – and the judge’s verdict. The court then becomes the keeper of the whole history and outcome of the case, available for public inquiries or as precedents for future rulings.

The job of tracking a case’s life cycle – its documents, filing fees, judge and jury selection, and hearing dates – is called “case management.”

Technologically speaking, it’s not a Herculean task to create an electronic filing system that can simplify every aspect of the court’s job. Documents could be filed by email or browser, authenticated and stored in unalterable digital form, and published on the Net for public access. Information could be siphoned directly into software that handled case management, eliminating redundant data entry. The system could collect filing fees, confirm receipt of filings, schedule hearings, and inform participants of the dates.

Moreover, lawyers, judges, and the public could have instant Web access to any document filed, a tiny change that would speed up trial preparation, opinion writing – indeed, the very delivery of justice. “Unlocatable documents are a fact of life today that waste endless amounts of time,” says Joe Kornowski, associate executive director of the Los Angeles County Bar Association. “To be able to access a docket in a particular case directly and immediately from a lawyer’s desktop would be really invaluable.”

Even better, a sophisticated e-filing system could allow judges and lawyers to electronically search not just established case law, which they can do with existing data-

bases, but the documents of live cases, instantaneously turning up specific passages without visually scanning hundreds of pages. Legal precedent could be cited with a hyperlink to a prior decision. Some e-filing evangelists foresee a new style of research in which a lawyer working on a case could elect to receive every relevant decision via email, with search software crawling every online court database to find it.

Had e-filing existed in 1995 and ’96, the O. J. Simpson trials would have been a whole lot easier; prosecutor Marcia Clark’s office could have delivered deposition transcripts electronically to Judge Ito’s clerk, and every one of the 435 criminal and 818 civil court documents that now sit in binders cluttering nearly 20 feet of downtown shelf space could have been sent and stored in digital form. More to the point: If e-filing had been in place last year, Microsoft would have been spared the hassle of renting a moving truck to ship boxes of files to Washington, DC, for its antitrust trial. And its attorneys could have searched with a mouse-click the 1,430 exhibits, more than a dozen deposition transcripts, direct testimonies, and over two dozen other filings the DOJ entered to make its case.

Online legal research, of course, is already

commonplace. Using Lexis, the legal arm of Lexis-Nexis, which offered its first dialup service in 1973, lawyers can do keyword searches in legal libraries and in archives of state and federal case law, statutes, and regulations. Lexis also offers online access to Shepard’s, a legal industry standard for checking the validity of case precedent (to verify a ruling hasn’t been overturned, for example) that is updated daily. Such services have kept attorneys out of libraries for years. But where Lexis and West Group, another legal publishing power, offer abstracts and summaries of cases that have already been ruled on, e-filing will add the capacity for looking up active cases – their full filing histories complete with pleadings, motions, and any other intermediary documents. E-filing would keep overburdened legal associates from having to visit courthouses or sweet-talk distant courtroom clerks into sending more recent documents, sometimes disheveled cartons full of them.

Perhaps the most significant change of all is that e-filing would democratize a justice system that is today controlled rigidly by attorneys, who revel in and profit from the inaccessibility of their arcane language and procedures. “The thing that will change the legal system more than anything is that litigants will have access to information too,” says Jerry Short, an e-filing entrepreneur working with Microsoft. “Today litigants are left in the dark, but e-filing will let them read minutes of what happened in proceedings they weren’t present in.”

It would also save taxpayers incalculable time and enormous amounts of money. A 1997 study conducted by a Shawnee County, Kansas, court and published by the National Center for State Courts found that electronic filing would save 9.63 work hours, or \$218.86, for every 100 documents filed. If that LA court division, with its 4,000 documents a day, experienced something similar it would save \$8,754.40 a day in handling costs alone – more than \$3 million a year.

But the tremendous adjustment required of the buttoned-down legal industry, which holds tight to the quagmire of rules that make up its Dickensian existence, means e-filing may be slow to catch on. “It takes a cultural shift,” says Kornowski, of the LA County Bar. The federal courts’ technical

requirements for e-filing, set forth by administrators in 1997, before any e-filing systems were even in place, demand that all electronic filings be submitted in Adobe's Portable Document Format. That way e-documents would look just like paper ones, so judges and lawyers wouldn't have to learn any new tricks.

For lawyers and judges to support a true change – a digitally searchable system where data location isn't even an issue – would take some doing. "It doesn't happen overnight," Kornowski says.

LA was ready earlier than most. Back in 1994, Ameritech approached the county court with an e-filing initiative. Hip to the future of ecommerce, the Midwestern Baby Bell was eager to convert its old copper wires into new data-carrying revenue streams. It figured to make a mint wiring the courts and charging lawyers for access. Law firms would pay every time they filed a document or looked one up online – and yet they would pay less than they do now for the messengers they hire to perform those errands.

To seed the idea, Ameritech dropped about \$6 million to set up a pilot program, called CivicLink, in Los Angeles. By 1996, the telco had signed up 200 law firms and decorated the dilapidated county courthouse with four Kodak imaging machines, 85 Hewlett-Packard workstations with 21-inch monitors, and some fancy server equipment. "If you were dreaming an automation fantasy – all the computers, all the tech support, all the money you need – I had that," recalls Antenoracruz, who was the court's point man on the project, with a wistful smile.

But only a handful of documents were filed before Ameritech pulled out. Its business partners say the company demanded revenues too soon. Word around LA's legal community was that not enough money went into marketing. Ameritech says it simply changed its ecommerce strategy. Whatever the reason, it left LA in the lurch, with the court and attorneys primed for e-filing, but no access to the goods.

When news of the retrenchment became public, LA found its e-ambitions the object of affection at several technology and legal services companies, all of which saw the city as a catapult to future profits. Landing LA, a court that serves 9.2 million people

spread across 4,000 square miles, would lend a company instant cachet with other courts around the country. "It sounds like a song," says Antenoracruz, "but if you can do it here you can do it anywhere." IBM, Oracle, and a slew of smaller tech vendors eager to craft e-filing solutions from their software approached the court. Lexis-Nexis also spoke up, as did the other legal information behemoth, West Group. Both were eyeing e-filing as an extension of their legal databases and attorney services.

It was 1996. Microsoft was nowhere in sight. Yet. The company had never paid much mind to legal software. With an economic model more akin to that of a hardware company – supplying the platform on which other software companies' applications run, along with some basic office applications – developing legal apps was a real stretch.

But Microsoft couldn't blithely dismiss an audience of 1.5 million law office and courthouse desktops. With one-quarter of the United States' large law firms each spending some \$300,000 in 1997 on software and a

firsthand that mega-revenues come from whole industries moving to a new platform – from paper to bytes, from Microsoft's outmoded DOS to Windows. For people to make such changes, the software had to perform functions they couldn't live without. In earlier years, the purpose was filled by such stalwart office applications as Word and Excel. But these venerable apps were no longer providing the growth to achieve Microsoft's goals, and increasingly, they were sharing the desktop with an army of tools tweaked to meet the specific needs of bankers, hoteliers, doctors – not all of them Windows-compatible. Most law firms, for example, find "time and billing" applications (specialized for legal accounting) indispensable. But many of those apps run on old versions of DOS or on the Mac, and require no system upgrade.

"So the question was: Should Microsoft go after these industry applications?" recalls MS executive Davide Vigano. In 1995 executive vice president Steve Ballmer answered that big question with a modest no. The market for such applications was scattered too wide and spread too thin among professions and businesses requiring specialized

*"Today, litigants are left in the dark."
Tomorrow, e-filing will democratize
the impenetrable world of attorneys.*

full 57 percent dishing out more than \$90,000 each for it, according to an American Bar Association survey, Redmond's interest was piqued.

Even as the Department of Justice was building its antitrust case against the software superpower, Microsoft was creating a blueprint for cracking open the legal trade – as well as other markets it had overlooked. Its interest was basic. By 1996, Microsoft had locked up 91.5 percent of the OS market; the figure is expected to grow to 96.5 percent in 1999, according to market researcher Dataquest. And the company's net income had been rising rapidly each year, growing from \$1 billion in 1994 to \$4.5 billion in 1998. To maintain that pace, Microsoft needed new ways to grow.

What was next? Gates and friends knew

tools. As Vigano puts it: "It's not possible for one company to do too many things well. So we decided to focus on the platform."

Instead of creating its own array of specialized apps and competing with third-party application developers, Ballmer decreed that Microsoft would partner with the specialists, and help them develop software that would run best on Windows. By lending financial and technical support, Microsoft could ensure that the next generation of must-have apps would run faster and smoother on Windows than on anything Apple or Novell or Sun could come up with.

To spearhead the effort, Ballmer, who is now Microsoft's president, dreamed up the Application Developers Customer Unit. By its June 1997 launch, ADCU (pronounced "ad-coo," like a soft sneeze) was a flush division, with a worldwide staff of 600 devoted

to bringing industries that had yet to embrace the latest Microsoft platform into the fold. ADCU leads the Microsoftian charge to invest \$500 million a year in partners whose tools are optimized for NT and SQL.

And Microsoft was willing to go a step further. The company was ready to put its marketing muscle behind this specialty software, even cobrand it, when appropriate, with the Microsoft name, to subtly compel customers to run the applications on an MS OS, even if they were also compatible with other operating systems. The independent software firms, naturally interested in seeing their product perform at its best and thankful for Microsoft's support, would, according to ADCU's strategy, become instant evangelists for the Microsoft cause.

One of the first things the ADCU team did was to create an "opportunity map," showing software usage across industries and pinpointing areas primed for technological transformation. Health care and financial services were among the 17 industries targeted. (The whole list can be found at

that would enable Microsoft to sell the legal industry more software.

Here was Cooke's thinking: In the past, Microsoft hadn't gone after many government accounts, which have long, complex sales cycles, and purchasing approval procedures that often depend on legislative budget meetings. Given Redmond's expertise in office applications, it seemed wiser to concentrate on the fatter side of the business: high-priced law firms that could pass the cost of electronic research on to their clients.

There are twice as many desktops in law offices (1 million) as in courts (500,000). Besides, Microsoft had experience marketing to law firms. It had been engaged in a long, hard battle to end WordPerfect's grip on attorneys. In 1994, WordPerfect was the text editor of choice for 90 percent of the legal market, which had been attracted by the "reveal codes" that let users see where they've told the program to bold or tab or indent the text – a critical feature in a profession where improperly formatted briefs are routinely turned away by courthouse clerks. Today, after years of concerted efforts

filing for a while.

Mike Payton, Choice's president, and his partner Terry Hahn had met in the early 1980s while developing software for NASA, and then teamed up in the private sector to create a PC-based case management system for the courts. They called it Sustain and sold it as a solution for courts to track filings and to tabulate administrative information, like the kinds of cases being heard and the number of jury trials.

The company's first sale, in 1987, was to a man named Jerry Short, a state employee responsible for collecting and analyzing statistics from the California courts, who rapidly grew enamored with the system. He figured that if all the state's courts adopted Sustain, clerks could generate with little more than the click of a button the same administrative report it took them days to tabulate.

Short began introducing Payton and his product to various courts, including LA's. Then, in 1989, Short left the state's employ, set up a consulting company, and created an unofficial partnership with Choice, becoming the company's outside sales, marketing, and systems implementation force. With Payton, the engineer, focusing on software development and the curly-headed Short schmoozing the contacts he'd made during his government days, the pair sold Choice to 120 courts in nine states and three countries over the last decade. Short, a fast-talking marketeer, has clearly enjoyed the ride. He literally lives out of a suitcase, running his operation from cell phones and an office at the Napa, California, courthouse, which has a deal with Choice.

The partners also started looking for opportunities beyond the creation of administrative reports, and soon focused on electronic filing. In the mid-1990s, most of their clients were still running a DOS version of Sustain, and, thanks in part to Sustain's configuration (which was then optimized for Novell), many had NetWare on the back end. But as the world transitioned to Windows and embraced NT, Choice began developing a prototype of a Windows-based case management system with an e-filing component that leaned on NT.

In mid-1997 Choice began a successful e-filing pilot project in Toronto. Attorneys filed documents over a proprietary dialup

Redmond created an "opportunity map,"
targeting sectors primed for transformation.
The legal community looked like rich territory.

www.microsoft.com/industry/industries.htm.)

The legal community was seen as rich territory. Courts and law offices were heavily reliant on DOS, thanks to dozens of crucial apps still dependent on it, and most networks were built on Novell's NetWare. Together, the two systems had become veritable industry standards. That made the legal industry, which had yet to move to Windows, NT, or BackOffice products, a wide-open target on the Microsoft map.

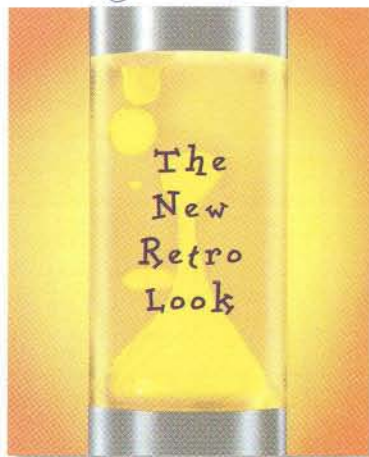
"As we looked at the legal industry," says Cory Linton, Microsoft's legal-market specialist, "we thought, before we get them to move off DOS there's going to have to be a compelling reason for them to do it. How can we get them to move?" To answer that question, Redmond hired Linton's predecessor, Gary Cooke, an expert in electronic legal research from Lexis-Nexis. Beginning in 1995, his job was to define the strategy

to spread its Word, Microsoft's application is used in 32 percent of small law firms and 40 percent of large law offices, while WordPerfect is used in 60 percent of both, according to an ABA study.

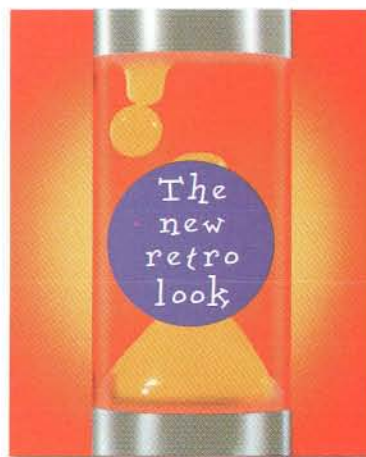
But Linton, who took over the legal industry marketing manager's job in mid-1997 straight out of Columbia University's business school, decided to overlook such trifles and chart a new path that would bring Microsoft far richer rewards. Rather than targeting either the law-firm market or the court market alone, he was looking for an app that could capture the interest of both sides, one that could bring the whole legal industry onto a modern Microsoft platform. And he found it at a trade show.

Choice Information Systems, a 14-person legal software shop in Newport News, Virginia, had been tinkering with electronic

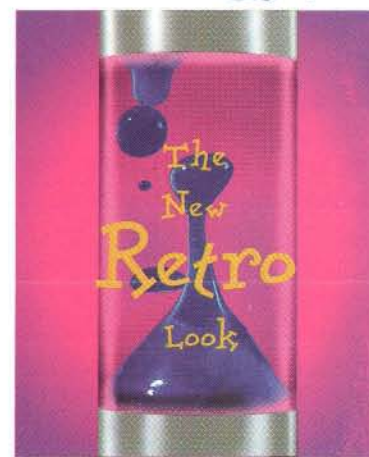
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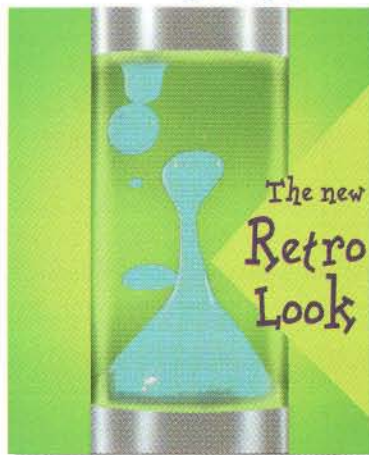
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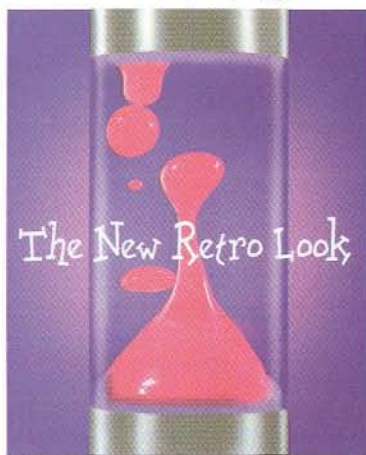
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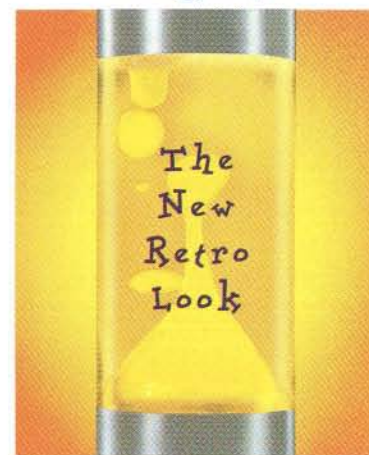
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network, and data was sucked into the case management and calendaring systems, while documents were published online. The system charged attorneys' bank accounts for filings and confirmed receipt of documents.

That project, which was built on Microsoft's NT and Exchange, got the attention of Cory Linton in Redmond. E-filing, he realized, was the kind of killer app that would simplify bureaucratic hassles for the entire legal trade, that could convince both law offices and courts to upgrade their systems and finally jettison DOS for Windows. Already, Choice's Toronto pilot project was using NT without any coaxing. If learning to play court clerk seemed a stretch for Red-

Payton and Short had already figured they would start with courts – in particular, courts like LA's, which were already using Choice's case management system – and sell them on the electronic filing component. Law offices would come later. "Judges are never going to give up their authority and turn the rulemaking over to attorneys," Short says. What's more, while "private industry is going to fund what works for it, you can't take away the government's responsibility to keep records and provide access to information."

Microsoft, although still keen to partner with software firms that could make an attorney interface optimized for its platforms, liked the idea of initially building

Many of Microsoft's ADCU partners get a potpourri of perks. The company sets milestones for its developer partners, and when the partner reaches one – when a certain percentage of the developer's sales are of products based on NT and SQL Server, for example – Redmond opens up its goodie bag. What Microsoft offered Choice was essentially the clout of its sales force, plus marketing and technical help, in exchange for Choice's continued development of e-filing products on the MS platform.

Choice really wanted a win in LA, a victory that could translate into publicity and sales elsewhere. And as the software industry showed every day, whoever got into the business first was likely to become the owner of a de facto standard. Microsoft knew the advantage of getting in early on e-filing and was eager to send salespeople and technical consultants to help Choice win business.

Within weeks of their meeting, Microsoft's Cory Linton had signed up not only Choice but also two other software makers eager to enter the e-filing space: PC Docs and Focus Systems. The idea was for Choice to provide the e-filing software that would suck data out of documents filed electronically and plug it into the case management software. PC Docs would integrate its document management product with Choice's system, so that as they were filed with the court, documents would be seamlessly transferred into law office databases. And Focus would build a front-end system for smaller law offices that didn't have extensive databases. Everything would run on a Microsoft platform.

There was no formal partnership among the group; no contracts and no money changed hands. But like any good Net Age virtual corporation, the foursome immediately issued a press release detailing the combined product they could offer. They called themselves the eCourt alliance.

Choice had already demo'd its e-filing product to the bellwether court of Los Angeles County and, despite all the attention from other tech companies, Antenorcruz says "it was a no-brainer" to go with it. The company had, after all, spent 10 years proving itself with the court's case management system. The problem was money.

It was spring 1998 when Antenorcruz got

An e-filing system adopted in California could become the de facto standard for the nation.

mond, well, it was already playing travel agent with its Expedia Web site and car salesman with CarPoint.

In September 1997, a colleague of Cory Linton's met up with Choice at the National Court Technology Conference, a mini-Comdex for the legal industry, and recommended to Linton that he check out the little software company. Linton invited Payton, Hahm, and Short to Redmond and spelled out the company's game plan: It was interested not in developing legal software, but in helping developers like Choice, who could in turn help Microsoft sell more of its platform software.

"The way they explained it was – Microsoft felt the legal community wasn't taking advantage of technology to the degree they wanted it to," recalls Payton. "They felt if the courts would provide the platform for attorneys to file electronically, lawyers would need more technology. If they needed more technology, Microsoft would make more money, yadda, yadda, yadda."

Short and Payton explained the demand for electronic filing and how their product would work, and Microsoft saw an opportunity to go after the market. "And then," says Short, "typical Microsoft, they asked us how we would do it."

an e-filing infrastructure for the courts. The Microsoft execs asked Choice to come up with a list of the six courts with which the company would start.

"So we stayed up all night in the hotel room coming up with a list, and in the morning we presented it to them," Short recalls. "And they said, 'Great.' It's like November 13th and they say, 'What do we do in December?'"

Retelling the story, Short lets out a booming guffaw. With a naïveté he still finds amusing, Microsoft thought it could bring those six courts into the digital age overnight. "They don't get how the courts work, how slow government adoption cycles are," he says.

Payton wasn't sure how an alliance with Microsoft would ultimately affect his business. "A lot of tech companies have wanted to hitch their wagon to us without actually providing us anything," he says. "Quite frankly, we checked them out."

He liked what he discovered. Microsoft wasn't offering to make a cash investment in Choice. But it was willing to partner informally with the small company to push for the widespread adoption of Choice's e-filing system, and the Microsoft BackOffice products it was already being built on.



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"It's an unsettling thought, but if every other technology company in the world mysteriously disappeared, we could probably get by on NEC alone."

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a grant to partially finance an e-filing pilot. Since California's "deadbeat dads" initiative had gone through – a 1992 law that requires the state to pursue parents who haven't paid their kids' child support – LA's family law court had seen its case burden skyrocket. Half of the family law court's 120,000 annual filings now come from child support cases. That growth provided Antenorcruc the argument he needed to persuade the state to allocate some money.

The e-filing project in LA's family law court was likely to cost about \$2 million – far more than the \$700,000 Antenorcruc could wrangle from the state. So Microsoft agreed to discount software, lend technical support, go for broke to get the thing running. Microsoft won't say how much it forked over, but others say the company donated about \$200,000 in software and unleashed a torrent of unbilled labor on the first phase of the project.

It was peanuts compared with Ameritech's \$6 million, and it won't be enough to get the second phase of the project in gear; that will require the next round of state funding. (For now, the court's system consists of the back-end databases and case manage-

so an e-filing system adopted in California could become the de facto standard for the nation. A meager investment, combined with a targeted strategy, could be all that's needed to give Microsoft control of the US court filing system.

"This could give them the opportunity to lock in every single desktop," says Burgess Allison, an attorney, systems administrator, and author of *The Lawyer's Guide to the Internet*, "and to make Microsoft products a prerequisite for any court or lawyer interested in filing electronically."

"How do we deal with the fact that it's Microsoft? That's something people have addressed," concedes Patricia Tyrrell, Napa's deputy county counsel. But so far, any concern that the courts might hand Microsoft another monopoly is outweighed by the promise of getting e-filing up and running.

Of course, it's not quite that simple. Unlike the OS market, there's serious competition in e-filing. Dozens of independent software vendors are building e-filing applications. Lexis-Nexis, the pioneer of online legal research, with 1.5 million subscribers, unveiled the first of its nine

numbering has given it a role in legal information similar to the one Microsoft's operating systems have in computing. "Nobody is competing with West," says Dean.

West's model for electronic filing looks like the opposite of the eCourt plan. While eCourt was built around a customer base of courts, WestFile Service is built around that company's indisputably large customer base among lawyers. So, while the two models will ultimately provide the same services, West isn't getting into the business of selling the courts on new technology. Instead, it will sell access to attorneys and bankroll the wiring of the courts. The cost – which Steven Daitch, the company's vice president of technology business development, defines vaguely as "huge" – is easily justified. "It's our market," says Daitch, who runs a 70-person technology incubator that is busy defining West's digital future.

Like Microsoft, West partnered with a case management software developer. Its partner, SCT Government Systems (which builds its product on Oracle technologies), came, like Choice, with a considerable installed base. West also snagged a bang-up partnership with IBM, which will contribute its long-standing government ties and the document management software – as PC Docs would in eCourt – to WestFile.

For West clients, e-filing would be a natural extension of their online archives – live cases, plus the convenience of desktop filing. Daitch envisions a customized WestFile page, displaying an attorney's cases and providing court rules and forms for the appropriate jurisdictions. Ultimately WestFile will probably weave in West's research and other legal services, too, to give law firms one-stop electronic shopping. E-filing could make West even more indispensable to attorneys.

To get the word out, West partnered with the National Center for State Courts to publish the 324-page *Guidebook for Electronic Court Filing*. The two also held regional seminars to give policymakers a comprehensive overview of the legal, fiscal, technological, and public policy issues for e-filing – and encourage them to go for it. West seems to be positioning itself as a decisive force in setting a standard for e-filing.

But Microsoft is unworried by West's moves. The West-IBM-SCT alliance may have

"eCourt could give Microsoft the opportunity to lock in every single desktop."

ment tools that will make e-filing possible, but there's no attorney interface, and PC Docs says it has done no development work on its document management piece of the puzzle.) But it has decidedly moved the LA court away from its long-standing dependence on Novell's NetWare and created a showcase for a little software provider and a software superpower.

Most important, LA may very well be step one in establishing an e-filing standard in California. Between LA and Napa County, where Choice is getting another pilot under way, there are scores of judges, lawyers, and court administrators lobbying to have an e-filing system adopted as the state standard. And just as the high school textbooks adopted by a giant state like Texas will influence education standards everywhere,

e-filing projects back in 1991. And the West Group is tackling e-filing with a tenacity befitting a Microsoft.

This isn't surprising, for West is "the Microsoft of the legal publishing world," in the words of Martin Dean, an industry expert who practiced law for 32 years and runs his own legal software firm. One hundred twenty-three years old, West owns the legal publishing market – or at least the definitive record of US case law – and takes in \$1.3 billion in annual revenues for providing access to it. West publishes over 75 million volumes of legal texts and 500 CD-ROM libraries of case law and legal data. Its key number system – a copyrighted index of US jurisprudence – has made it part of the day-to-day workings of the legal system.

Indeed, West's de facto monopoly on key

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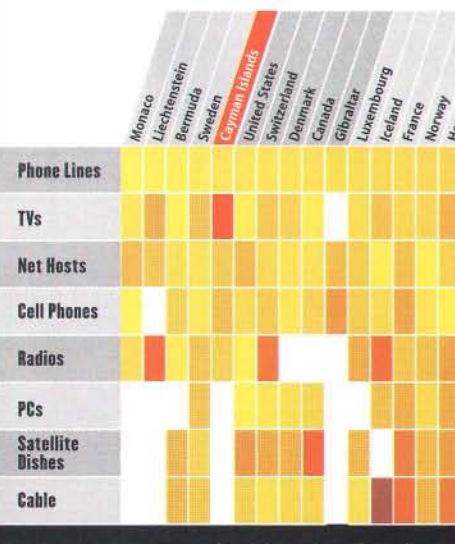
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more big names than the eCourt alliance, but with Choice, Linton says, "We're first to get the courts up and going."

It's not that Linton perceives a lack of competition. It's just that he's determined that if West, Lexis, or anyone else gets a serious e-filing campaign under way, Microsoft will go tooth and nail to get a piece of the action. As per Ballmer's instructions, however, it will do so not by competing, but by partnering – even partnering with West. In fact, the two companies have already talked.

Microsoft already has a piece of LA. The Superior Court is converting its Sustain case management system on DOS to the new Sustain Justice Edition on Windows, and in the process of deploying NT where once there was Novell's NetWare. Before the court's databases are consolidated, they are considering moving to Microsoft SQL Server from Btrieve, a PC-based database once owned by Novell.

"We need to move to Microsoft, because that's what our consultants are asking us to do," says Mike Ewing, assistant division chief for records management at the LA Superior Court. In his office adjacent to one of the court's mammoth filing rooms, he sits beneath an air purifier and confides that he is not necessarily thrilled about the move. "This has been a Novell shop, and we have a lot of people who understand NetWare well, so it's not a simple decision to change. But with Novell, if we have a glitch they say to us: We don't have a patch for it, you need to work it out with your software vendor." Microsoft, by comparison, sends its people straight over to work out the kinks. (Novell appears to be doing little to stop the flow of customers to NT. "The reality for most businesses is that it's a case of NetWare and NT, not NetWare or NT," is how Novell spokesperson Raymond Nasr chooses to characterize the situation.)

Choice's long-term clients at the Napa court are also switching from NetWare to Windows NT, but Short and Payton say Choice isn't requiring customers to use Microsoft products. "We don't make a dime off Microsoft," says Short. He gets perks, like a press person paid for by Microsoft and Microsoft sales reps to help close new accounts. But – despite the fact that Choice

has evinced considerable sway with the clients it's spent a decade nurturing – it has no financial arrangement, indeed no formal relationship at all, with the software king-maker.

"I'm more interested in Microsoft's technological prowess and muscle to create a standard," Short says. "If the largest software company in the world is behind it, maybe they can convince the courts to adopt a common platform."

In other words, Ballmer, who has called ADCU one of his best decisions, was right about converting independent software developers into MS evangelists. With little money and no binding commitments, Redmond is beginning to bring the legal industry onto its platform.

Tony Antenorcruz has seen little of Microsoft since the early stages of the project. Cruising the LA County courthouse's fluorescent-lit corridors, still crowded with clerks, messengers, and young mothers totting their toddlers through the legal maze, his voice betrays a hint of frustration: "Before, there was all the excitement, all the talk, but now we're in the trenches. This is the reality stage." Computers are being configured and data transferred to make e-filing possible. But there is an edge of pessimism in LA, a bitter twinge of fear that eCourt could go the way of Ameritech – not by pulling out, but by moving like molasses.

Even Linton, in Redmond, admits it hasn't been the overnight rollout he would have liked. "Los Angeles is a big, complex place, and it's taking longer than I thought," he says, laying blame on cultural issues for the slowness. "It'll be another year before there's a compelling case study that shows LA is saving x million dollars on this."

But Linton isn't backing down in the slightest. In the interim, Microsoft will have plenty of time to tweak its approach, fine-tune its offerings, and sign on new e-filing partners.

"Our objective is to get the whole industry on an electronic platform," he says. LA is just the introduction. ■ ■ ■

Kaitlin Quistgaard (kquix@earthlink.net) is a frequent contributor to Wired.

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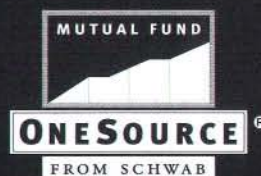
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Award-Winning Local Journalists Reflect Own Self-Hatred Back on Nightmarish World*

By Liesl Schillinger

Anyone who has ever scavenged the Net for laughs can understand the gratitude lavished on *The Onion* (www.theonion.com) by an adoring public: There's a lot of drivel out there. Casual comedy-surfs dig up sites stoked with Dixie-cup gags that made you yawn when you were eight; sex-and-dismemberment riffs on Princess Diana and Nicole Brown Simpson that make you wish computers came with side-mounted surf-sickness bags; and spammy lists of faux-Martha Stewart Christmas tips, DIY *Dilbert* yuks, and so on – not to mention the endless spew of Clinton-Lewinsky jokes so stale they couldn't make it on Leno or Letterman or even into the cartoons of the *New York Post*.

And then there is *The Onion* – “America’s Finest News Source” – which induces helpless laughter by skipping the shtick and telling it like it is. Celebrating its 11th year on paper, its third as the Web’s leading source of satire, and its first as an out-of-control pop icon, *The Onion* may be vulgar, insensitive, sexist, racist, ageist, antipapist, or even, on occasion, offensive, but unlike its Web rivals, it’s bankably funny. That is, of course, in the opinion of the people who *get* it. But for those poor clods who mistake them for real news, *Onion* stories often have a bitter tang.

For instance, when *The Onion* in February 1998 ran the scoop CLINTON DENIES LEWINSKY ALLEGATIONS: ‘WE DID NOT HAVE SEX, WE MADE LOVE,’ SAYS PRESIDENT, Democratic action groups called the offices to protest what they mistook for a partisan dig. Following the much ballyhooed birth of the seven McCaughey babies, *The Onion* reported a similar case abroad: CHINESE WOMAN GIVES BIRTH TO SEPTUPLETS: HAS ONE WEEK TO CHOOSE, explaining that the surplus six infants would be flung from a mountaintop “in accordance with Chinese multiple-birth law.” Email soon reached *The Onion*’s offices, informing the staff that heartsick churchwomen were holding

prayer vigils. POPE CONDEMNS THREE MORE GLANDS prompted neurotic correspondence from pious souls who feared they might be guilty of internal sin, and when *The Onion* ran a photo feature on NEW SMOKABLE NICOTINE STICKS that could help smokers quit, gullible doctors and nurses phoned in to find out how to obtain them for their patients. “You can get them anywhere,” incredulous *Onion* staffers told the callers. “They’re called cigarettes.”

The confusion is easy to understand. Despite *The Onion*’s cocky motto *Tu stultus es* – “You are dumb” – people are not duped merely because they are dumb, nor simply



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because *The Onion* sets out to mislead, but also because readers cut, paste, and forward *Onion* stories to friends and newsgroups without saying where they came from. Through the overly literal sorting process of the Net, outrageous accounts fall into straight-laced searches, bringing satire to people who are in no way prepared for it. Well-meaning new parents, trawling for general information on infant care, have called *The Onion* to protest that their Net searches turned up NEW YORK TO INSTALL SPECIAL 'INFANTS ONLY' DUMPSTERS – an invention the article described as part of an “ongoing campaign to revitalize New York City’s public image.”

“You’d be amazed,” says *Onion* managing editor Robert Siegel, a boyish but exhausted-looking 27-year-old. “People see things in

remained the eccentric passion of students and anarcho-syndicalist academics in Madison (home of the University of Wisconsin) and a handful of humor buffs in New York and Los Angeles. After a few years, some of the writers ditched their \$10-a-week gigs at the paper to try their luck out on the coasts, and now, a few alums write for places like the *Late Show with David Letterman* and *Buffy the Vampire Slayer*. But otherwise, word of *The Onion* rarely spread beyond the coot-rich waters of Lake Monona or the nearby shores of Lake Michigan.

The paper was founded by Tim Keck and Christopher Johnson, who now publish, respectively, *The Stranger* in Seattle and Albuquerque’s *Weekly Alibi*. They named it *The Onion* for no reason but whimsy,

says. “It felt like a new guard.” It’s this new-guard *Onion* that’s hit the big time.

In person, the writers – not counting Siegel, Dikkers, and graphics editor Mike Loew, who are lean and presentable, more or less – are a grumbling, beflanneled herd of irascible couch potatoes. There are five full-time humor writers. Todd Hanson, the famously glum head writer, looks like Jesus, if Jesus had eaten a lot more fries. Carol Kolb, his girlfriend, recently incensed passersby in her busy neighborhood by installing a poignant shrine to a dead baby – complete with a framed photograph and artificial flowers – in a ditch in front of her house. She specializes in bleak, squalid tales, such as IT’S NOT A CRACK HOUSE, IT’S A CRACK HOME and the much reprinted essay by Thunder the Ferret, I CAN’T STAND MY FILTHY HIPPIE OWNER. Then there is Maria Schneider, small, plump, smiling, reminiscent of Mrs. Piggle-Wiggle, and the only writer whose desk décor is not overtly terrifying. She has a pink flapper’s feather taped to the computer, where she writes her popular column “by” Herbert Kornfeld, a drab middle manager who speaks a foul-mouthed jive, and her weekly “message” from T. Herman Zweibel, *The Onion*’s demented, libidinous “publisher emeritus.” John Krewson, who looks like Travis Bickle and once did drive a cab in New York City, writes the horoscopes; a December offering to birthday-week Sagittarians: “Though it’s certainly true that you’re not as young as you used to be, the stars say you’re just about as old as you’ll ever be.” Finally, there’s Tim Harrod, the most recent hire: a pale, flaxen-haired, muttering presence who writes the “News In Brief.” In 1996 Harrod relentlessly bombarded the editors with viable headlines until Dikkers gave up and let him join.

The writers and editors work together all week, with only Mondays off, and Siegel and the writers hang out together after hours. Dikkers and Loew tend to keep more of a distance. Dikkers, who looks like a monk moonlighting as a Navy SEAL, and Loew, who is 25, 6’ 4”, and so silencingly cool that he seems like an anime cartoon of an anime cartoonist, are both loners. But the whole team comes together to make humor. Loew’s family photo will appear in *The Onion*’s

Through the overly literal sorting process of the Net, outrageous accounts fall into straight-laced searches.

print, especially when there’s no byline, and they don’t say, “‘Gee, this article sounds pretty crazy.’ They regard the printed word as having dropped from the heavens.”

This, of course, is just what Siegel wants. “We love to be misunderstood,” he smiles. Still, not all misappropriations are equal. A recent cover story, ‘98 HOMOSEXUAL-RECRUITMENT DRIVE NEARING GOAL was picked up by Fred Phelps, architect of the notorious God Hates Fags Web site, who listed the article as proof of a gay conspiracy. *Onion* Webmaster Jack Szwegold quickly doctored the link so that Phelps groupies who clicked on it would be transported to *The Onion*’s homepage, where they would understand (he hoped) that it was a spoof of the very kind of homophobic paranoia Phelps peddles.

There was a time not all that long ago when hardly anyone misunderstood *The Onion*, because not that many people read it. Between 1988, when it was founded in Madison, Wisconsin, and 1996, when the Web site was launched, the paper was distributed only in the Midwest, and its volatile charms

though some say *onion* is old-time slang for a juicy, multilayered news story. In ‘89, *The Onion*’s second year, Keck and Johnson sold the paper, then just a black-and-white sheet sprinkled with jokes, to some of their colleagues, including Scott Dikkers, a 24-year-old cartoonist and editor, and 21-year-old Peter Haise. Dikkers became editor in chief and his friend Haise the business manager. Ten years later they’re still at it.

In time they built what Andrew Welyczko, *The Onion*’s design director since 1996, calls “a successful college-humor rag.” Profits increased year by year, until, in the summer of 1995, Dikkers decided it was folly not to attempt the jump from campus to the real world. His plan was to cut the heavy-handed humor and attempt a more subtle goal; to lampoon *USA Today* with a color-enhanced version that used deadpan journalese to assault the banality of everyday life and to spoof major news events. Welyczko perfected the design, and Siegel, who had joined the staff as a writer earlier in the year, introduced the new no-nonsense, Associated Press style. “Robert’s writing style was perfect,” Dikkers

* We made *The Onion* editors write this headline. Here are some others they suggested:

Area Newspaper Hates World, Life, You Glorified College Rag Somehow Snags Book Deal Headline-Makers Make Headlines

forthcoming book *Our Dumb Century*, illustrating a story called IOWA FAMILY BLASTED FOR LACK OF DIVERSITY. Dikkers, who has only once dropped in on the staff's annual Christmas bash (attended by the full 50 members of the supporting cast, including distributors and ad salespeople), spends most of his time overseeing *The Onion's* new high-profile projects and looming over his staff as a do-not-disappoint-me figure. Still, he weighs in from time to time with columns, such as "Smooove B." A recent Smooove invitation to an unnamed ladyfriend titled I GOT WHAT YOU NEED begins, "You are looking very fine. I am serious. But I am not here to tease you with words," and takes the lady through an imaginary evening out with His Smoooveness, during which she will be treated to dinner at a restaurant where "there will also be cloth napkins" and then whisked to a bedroom where, he vows, "I will sex you wild" on sheets that will be "sparkling clean, as they will have been washed with only the finest laundry detergents." A jilted boyfriend later emailed Smooove's honeyed words to his ex at the University of Arizona. She promptly called the police.

Onion HQ is a stuffy, low-ceilinged, gray-carpeted suite of offices near Madison's capitol building. To pinpoint the office more precisely would be unkind; the staff lives in terror of being hunted down by talentless gag writers. *The Onion* does not publish its street address, there is no plaque in the lobby, and, indeed, from the street no sign hints that any activity occurs in the building other than lawyering, accounting, or UW Badger boosting.

The Onion's weekly war on complacency is waged in a bedraggled den known as the "writers' room," where Schneider, Kolb, Hanson, and Krewson have their desks. With its Satanic-nursery kitsch clutter, its squishy brown modular sofa chunks, and its Chex mix of free-floating crud on the floor, the room recalls an East Village cybercafé. On Tuesdays, everyone piles in with their fast food and diet sodas, and what unfolds is a revival meeting set in newsroom hell. Their inspiration is fueled not by malevolent glee, Siegel says, but by "serious personal problems, evil politicians, and the sad state the

world is in." On a dry-erase board late in November, a story idea from a previous Tuesday lingered: VIOLENCE: THE ANSWER?

The currency of every Tuesday meeting is headlines. Every article, whether a cover story, a news brief, a feature, or just a one-line teaser or poll question, starts as a headline. For each news-based story one person suggests a headline, another may write the article, and still others edit that, and whether one or six pencils produce the effort, in the end there will be no byline. This anonymity means that every *Onion* writer is invested in every *Onion* story; as in the old Hollywood studio system that produced *Casablanca*, everyone feels pressure to excel, nobody gets sole credit for anything, and the work ends by being a true collaboration. This kind of teamwork doesn't happen easily in cutthroat comic environments like *Saturday Night Live*, where writers compete or get sacked; it is only possible here because the writers are not only rivals, they are a handpicked group of friends selected over the course of a decade, and they're not afraid to scream at each other when they disagree. "We're like a family," Siegel says. "There are stretches of time where we just hate each other." Still, he allows, cringing as he says it, they do have a "synergy" that other comedy klatches lack. Whatever it is they have, it's something a growing number of people want in on.

Late last summer, Crown shelled out \$450,000 for two *Onion* books, one of them a best-of collection, the other *Our Dumb Century: 100 Years of Headlines from America's Finest News Source* – a year-by-year romp through imaginary front pages of ye olde *Onion*, which is due in stores next month and slated to be promoted with an hour-long network-TV special written by Dikkers and staff. The pages of *Our Dumb Century* resemble Wendy's restaurant tabletops but the headlines breathe new life into yesterday's news. A front page dated July 21, 1969, reads HOLY SHIT: MAN WALKS ON FUCKING MOON; a related editorial asks WE CAN PUT A MAN ON THE MOON, BUT WE CAN'T BOMB A TINY ASIAN NATION INTO THE STONE AGE? Hyperion Press, which had originally bought the book, ditched the project late in the game when the "right lawyer," as Siegel put it, finally saw

the manuscript and proclaimed it too controversial. Siegel shakes his head: "I don't know what they were thinking."

The flattering rush of attention from book publishers, TV networks, and even Hollywood does not come from *The Onion's* humor alone; if that were true, the staff would have long since relocated to palm-dotted Sunset Boulevard digs. The sudden vogue is the result of the fact that in May of 1996 *The Onion* finally put the paper online, a move that Dikkers, a Web skeptic, had staunchly resisted. Jack Szwergold convinced Dikkers that a move online was necessary to increase readership. He was right: Now that people can read *The Onion* without flying to Madison, 1.2 million a month do. The paper version has 363,400 subscribers, but 300,000 readers cackle over online postings each week, most of them from their desks, in their offices, where they are supposed to be working. "In a way, all our readership is white-collar crime," Szwergold muses. Indeed, some companies have caught on to the scam, and lately Szwergold and Siegel have received calls and email from distressed employees at Andersen Consulting and Salmon Smith Barney complaining that they can only log on to *The Onion* at home.

It was a pre-Web story by Siegel, published in December 1995, that convinced Dikkers to make the leap to cyberspace. In the story, CLINTON DEPLOYS VOWELS TO BOSNIA: CITIES OF SJLBVDNZV, GRZNY TO BE FIRST RECIPIENTS, Siegel described "Operation Vowel Storm," which would "provide the region with the critically needed letters A, E, I, O, and U, and is hoped to render countless Bosnian names more pronounceable." The article also quoted a desperate Bosnian, Trszg Grzdnjlkn, 44, who wailed, "My God, I do not think we can last another day. I have six children and none of them has a name that is understandable to me or anyone else. Mr. Clinton, please send my poor, wretched family just one 'E.' Please."

Before long, the story was circulating wildly on the Web. The following February, not knowing where it came from, the hosts of the NPR radio show *Car Talk* stumblingly read the entire piece on the air, laughing so hard they could barely speak. Art Bell recited the story on his radio show, and Pat Buchanan's

And a few they missed:

Onion Editors Discover Prozac, Renounce Humor, Satan, Revenge Secret Source of Onion Jokes Revealed: Tipper Gore Onion to World: Go to Hell

presidential campaigners ran it on the Go Pat Go Web site. Nobody credited *The Onion*, because nobody knew *The Onion* was the original source. Going online, Szwergold told Dikkers, would mean that when a story got filched and began to crop up across the country in newspapers, Web sites, and TV programs, *The Onion* could prove that the copycats had stolen someone else's punch lines. Credit could go where credit was due. Dikkers agreed to go online, and what Szwergold predicted came true. In 1996, Chevy Chase, an avowed *Onion* fan, plucked "Vowel Storm" off the site for yet another public airing; he read it out loud to President Clinton and other Democratic bigs at a DNC fundraiser in New York – and he made sure to credit *The Onion*. The president, Chase says, laughed heartily, calling it the funniest thing he'd ever heard, and thanked "Chvy Chs" – leaving out the vowels – for the humor break.

The paper version has 363,400 subscribers, but 300,000 readers cackle over online postings each week, most of them from their desks.

During the summer and fall of 1996, the staff sat back and watched, stunned, as the anonymous, miserably paid years of work they had spent financing their *Onion* habit by temping, washing dishes, and cashiering in liquor stores part-time at last started paying off. They started getting salaries and benefits – and, in another unexpected perk, e-correspondence with great and wise men. Douglas Adams, author of *The Hitchhiker's Guide to the Galaxy*, emailed his credit card number so they could debit him \$40 for the pleasure of his (free) subscription, and when *The Onion* ran a story about how the astrophysicist Stephen Hawking had thrown away his wheelchair and welded his head to a Robocop-like exoskeleton, Hawking emailed, "You have blown my cover as a wheelchair-bound mad professor. But little do you guess I'm really a Time Lord from Andromeda."

People still do rip off *The Onion*, but in a surprising twist that Dikkers, in his pre-Web gloom, did not anticipate, the bon mot thieves who try to pass off *Onion* gems as their own soon find themselves assailed by rabid legions of cultlike fans. When loyal

readers come across a newspaper or Web site that pirates *The Onion*, they routinely email the "borrowers," suggesting that the source be credited; and sometimes they don't stop there.

Last fall, when talk-show host Tom Snyder read out the story CONGRESS PASSES AMERICANS WITH NO ABILITIES ACT on his show (which prompted email from dozens of citizens who wanted to know if they qualified), Dikkers randomly called up LA subscribers for help. Within 10 minutes he found someone who happily agreed to drop everything and drive a copy of the relevant issue to Snyder's set so the TV personality could show *The Onion* on air if he felt like it – which he did. *Onion* lawyer Ken Artis says fondly of the publication's online following, "If they were bounty hunters, they couldn't be better," and even Dikkers is impressed by their loyalty. "It's great," he says gruffly. "We're going to have

them all kill themselves one day. We'll pass out Kool-Aid." He laughs, adding, "We were all raised Christian here."

This spiritual impulse may explain two recent religious offerings in *The Onion*'s news sections: the feature GOD ANSWERS PRAYERS OF PARALYZED LITTLE BOY: 'NO,' SAYS GOD and the memorable November 1998 front-page story CHRIST KILLS 2, INJURES 7 IN ABORTION CLINIC ATTACK.

In the photo collage by Mike Loew that accompanied the clinic article, a guilty-looking, bearded Christ wearing an orange prison jumpsuit and a crown of thorns is led away by cops. Dikkers loves this one – indignant right-to-lifers be damned. "I get *USA Today* and read it and I think, 'This is somebody's idea of what's going on in the world today – but it's really not all that relevant to me, it doesn't touch me,'" he says. "But I look at *The Onion*, and it's filled with humor and sadness."

"For us, comedy equals tragedy," Dikkers elaborates. "Mel Brooks said comedy equals tragedy plus time. It's funny: One of the reasons why people conceive of us as edgy,

or groundbreaking, is because we're telling jokes about tragic events much more close to the tragic event than you're supposed to." Sometimes this immediacy offends. For example, the story 5,000 BROWN PEOPLE DEAD SOMEWHERE, a send-up of disaster coverage and First World indifference to the Third World, ran a bit too soon after Hurricane Mitch devastated Central America to strike some readers as funny. Dikkers wasn't bothered. "I think we're very much speaking for a new type of sensibility that's very prevalent in our generation here," Dikkers says. "There is nothing sacred, there is nothing offensive, there's nothing too horrible to say."

We would have been much more famous much sooner if we'd been in San Francisco or New York," Dikkers likes to grouse. It is the office mantra; improbable as it may seem, the bawdy, brutal, high-spirited *Onion* is, in the end, the product of a handful of overworked, depressed, caffeine-raddled malcontents who live in fear that the floor will collapse under them. "You'd be surprised how close the margin is between a funny, hilarious, that's-the-funniest-thing-I've-ever-seen publication and a totally mediocre, OK publication," Dikkers says. "We ride that line every week." Siegel, who is responsible for holding that line, wrestles mightily with his own personal demons. "If one person says we're not funny, I'll believe that person instead of the 10,000 who say we are," he says. "My confidence would be shattered."

Sure, sure, and he believes it too. But that doesn't mean he and Dikkers and the whole sad-sack staff aren't gunning for *Our Dumb Century* to turn them into obnoxious, unrepentant millionaires overnight. Until then, they're contenting themselves with smaller but no less transforming fantasies. This month, for the first time, the newly famous *Onioners* will attend the US Comedy Arts Festival in Aspen, and one of them, at least, may get his slice of heaven. John Krewson, running a hand over his freshly shaven scalp, says dreamily, "I'm going to go up to Janeane Garofalo and say 'You're pretttttty.'" His fervent hope is that she will slap him. ■ ■ ■

Liesl Schillinger (liesl_schillinger@newyorker.com) wrote "The Double Life of Robert X. Cringely" in *Wired* 6.12.

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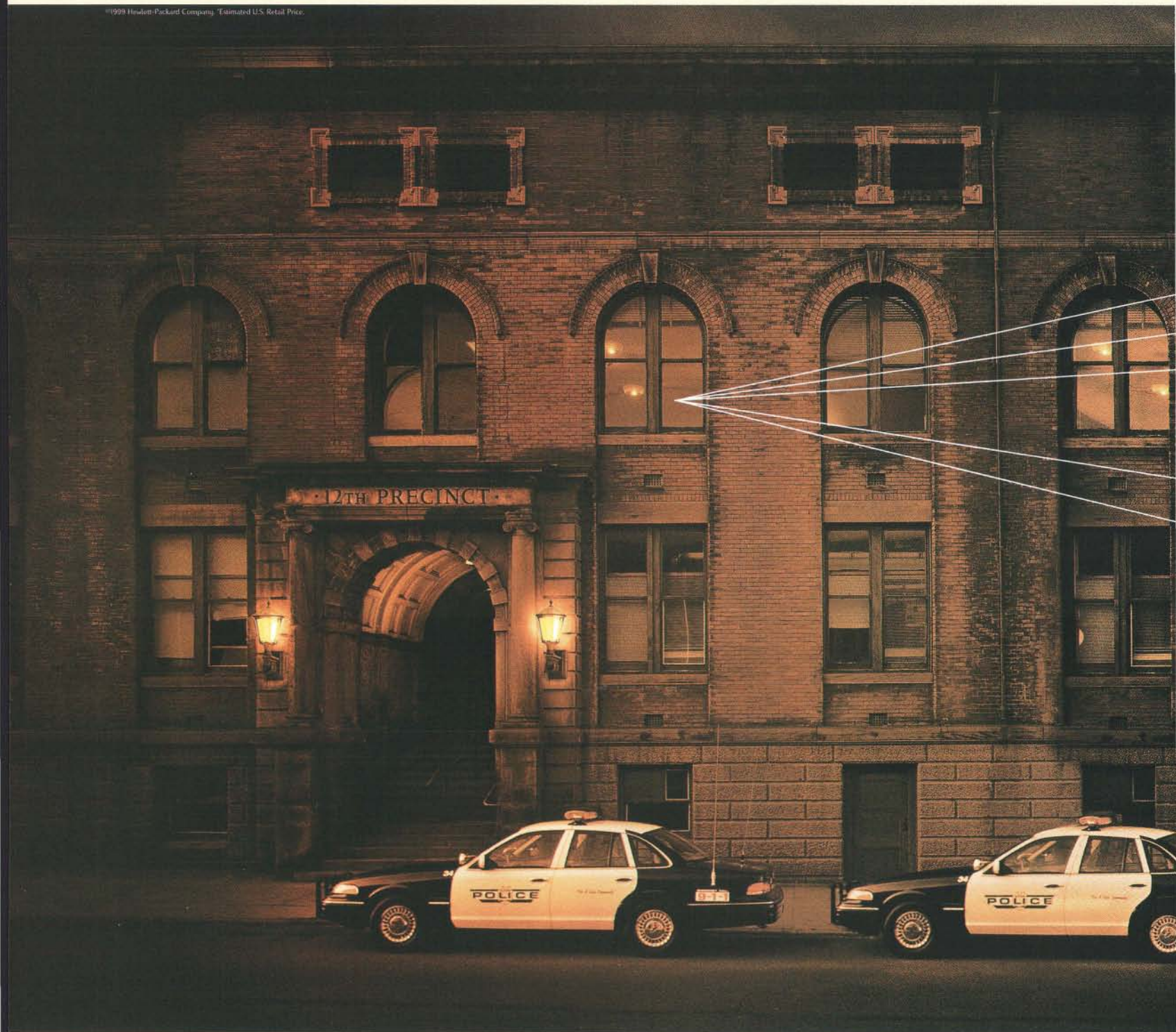
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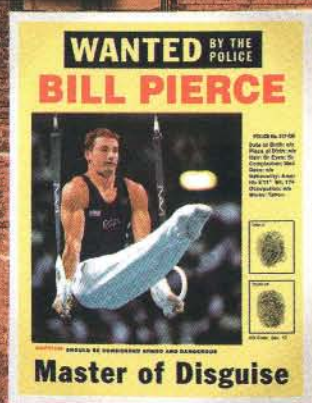
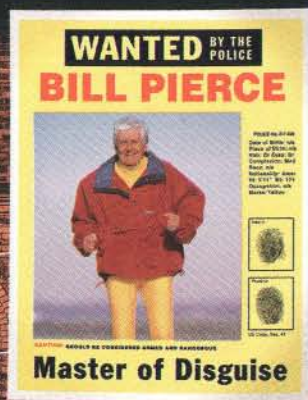
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THE INNER BEZOS

Amazon.com's founder
figured out how to sell books on the Web,
and now he wants to **sell you everything** else.
Simple, right? So **why** is he so far ahead of the pack?

By Chip Bayers

The counter clerks at Amelia Island's Flash Foods convenience store never saw it coming. Around Christmas 1997, a rented white Chevrolet Suburban pulled into the parking lot and disgorged three members of a commando squad on a mission. The team was disguised in the tourist garb common to the Florida resort island, and the only hint that it might be a military operation was the way the squad members whispered code words like "Whiskey, Bravo, Tango" into their Motorola walkie-talkies. While the driver sat in the car and timed the exercise, a second soldier stood guard at the door. Another quickly grabbed a spot in line for the cashier. The fourth rushed toward the dairy case in quest of the squad's ultimate goal: a quart of milk.

Within two minutes, the purchase was completed and the car was roaring back onto the streets.

One of these odd customers bore the code name Ffej Sozeb. If the clerks had heard this nom de guerre, they still might not have figured out that they'd been hit by a pioneering Internet entrepreneur who one

As Internet commerce matures, Bezos faces the same challenges that confronted the great retailers who invented the mass market for consumer goods a century ago.

year later would be worth north of \$9 billion. The slightly built, 5'8", brown-eyed faux Navy SEAL with thinning hair was, in reality, Jeff Bezos, founder, chair, and CEO of Amazon.com. His comrades on this mission of breakfast necessity were members of his immediate family: father Mike, brother Mark. Behind the wheel: his mother Jackie.

That Jeff Bezos is almost innately programmed to turn something as mundane as a milk run into a fantasy game should serve him well during the next few years, as he attempts to drive Amazon.com beyond its phenomenal, if so far unprofitable, early success as a book, music, and video seller. The 35-year-old Bezos must make Amazon.com, to this point little more than a convenient place to shop for a limited range of goods, the kind of environment that lures men, women, and children in from vast distances, then seduces them into acts of acquisition. As Internet commerce matures from the exotic to the everyday, as it becomes less about exploiting a position on the frontiers of technology and more about mastering the art of sales and

merchandising, the challenges Bezos faces have become exactly those that confronted the great retailers who invented the mass market for consumer goods in the United States a century ago.

To reach historical heights – to become as important to 21st-century culture as Richard W. Sears, Macy's Isidor Straus, and John Wanamaker were to the culture of the late 19th and early 20th centuries, when they fundamentally changed not only the experience of shopping but also the essential nature of American life – Bezos will need to deliver on the second promise in the oft-repeated goal he sets for his staff: "to build a valuable and *lasting* company."

"It's a question," says Stanley Marcus, chair emeritus of Neiman Marcus, with the simplicity of an expert in long distance seduction, "of how you get the merchandise you're infatuated with into the hands of the people you like."

The goal is within reach. Bezos's vision has always been about taking advantage of a new platform and new tools to change shopping itself. Long before he launched the company, he had dreams of making Amazon.com "broader than books and music" – a point reinforced this past Christmas season by his move into gift sales and by his December move to offer Amazon.com customers goods from other retailers. Analysts who had projected \$190 million in revenue for the company during the fourth-quarter holiday period were flabbergasted when Amazon.com registered sales of approximately \$250 million, news that helped send

the company's stock as high as \$350 per share by early January (shortly before a three-for-one stock split) – just shy of the \$400 per share CIBC Oppenheimer foresees by 2002.



f Jeff Bezos's vision comes true, here's how you'll shop in 2020:

The vast bulk of store-bought goods – food staples, paper products, cleaning supplies, and the like – you will order electronically. Some physical storefronts will survive, but they'll have to offer at least one of two things: entertainment value or immediate convenience.

Successful "shoptainers" will be like the Gap, with its environment of music and youth culture, or Nordstrom, with its tinkling pianist and distinctive face-to-face service. They may be even more amplified, with personal service and showmanship turning every shopping trip into a Super Bowl-style destination event. "That experience is what you get when you go to movie theaters, and why you don't always rent movies, right?" Bezos notes.

Convenience specialists will also have contemporary antecedents – the 7-Eleven chain, say, or Walgreen's, where you can get a quart of milk or NyQuil geltabs at 10 p.m. – but these, too, will evolve: open 24/7, for example, so that you can take care of the last mile of delivery yourself at any time. The consultants at the Global Business Network even sketch out a scenario where, within a generation or two, vans carrying inventories of more popular necessities, such as toilet paper or diapers, may be constantly circling neighborhoods, ready to drop off an order within moments of receiving it.

The United States – whose culture has been defined by consumption since at least the 1840s, when the British consul in Boston was appalled to see servant girls "strongly infected with the national bad taste for being overdressed" – will be utterly transformed, Bezos believes, by this bifurcation of shopping and consumer desire into shoptainment and just-in-time components. The urban downtowns, which just a few years ago planners and politicians gave up for dead, will continue to renew and thrive, thanks to the inherent entertainment value in the great retail districts like Times Square or Pine Street in Seattle. Yet within a generation's time the kitschy and cluttered landscape of today's suburbia will disappear, because the new retail environment won't support "the sort of bad stores that people go to because they don't have any alternative."

"Strip malls," Bezos predicts, "are history."

Bezos reserves an evangelical passion for the changes he expects in the most manipulative aspects of today's consumer culture.

Senior writer Chip Bayers (chip@wired.com) wrote "Push Comes to Shove" in Wired 7.02.

COUNT THE CHANGE: ALL \$22.1 BILLION OF IT*

AMAZON.COM THUMBNAIL

Opened for business:	July 1995
Market cap at IPO:	\$ 503 million
Market cap January 19, 1999:	\$22.1 billion
Value of Jeff Bezos's shares:	\$ 9.1 billion
Current number of titles (books, CDs, videos, DVDs, games):	4.7 million

NET SALES

Year end 1995:	\$511,000
End of third quarter 1998:	\$360 million

NET LOSSES

Year end 1995:	\$303,000
End of third quarter 1998:	\$85 million

NUMBER OF FULL-TIME EMPLOYEES

Year end 1995:	11
End of third quarter 1998:	1,600

CUSTOMERS

Number of customers, year end 1996:	180,000
Percentage of repeat buyers:	40
Number of customers, year end 1997:	1.5 million
Percentage of repeat buyers:	58
Number of customers, end of third quarter 1998:	4.5 million
Percentage of repeat buyers:	64

CORPORATE ACQUISITIONS

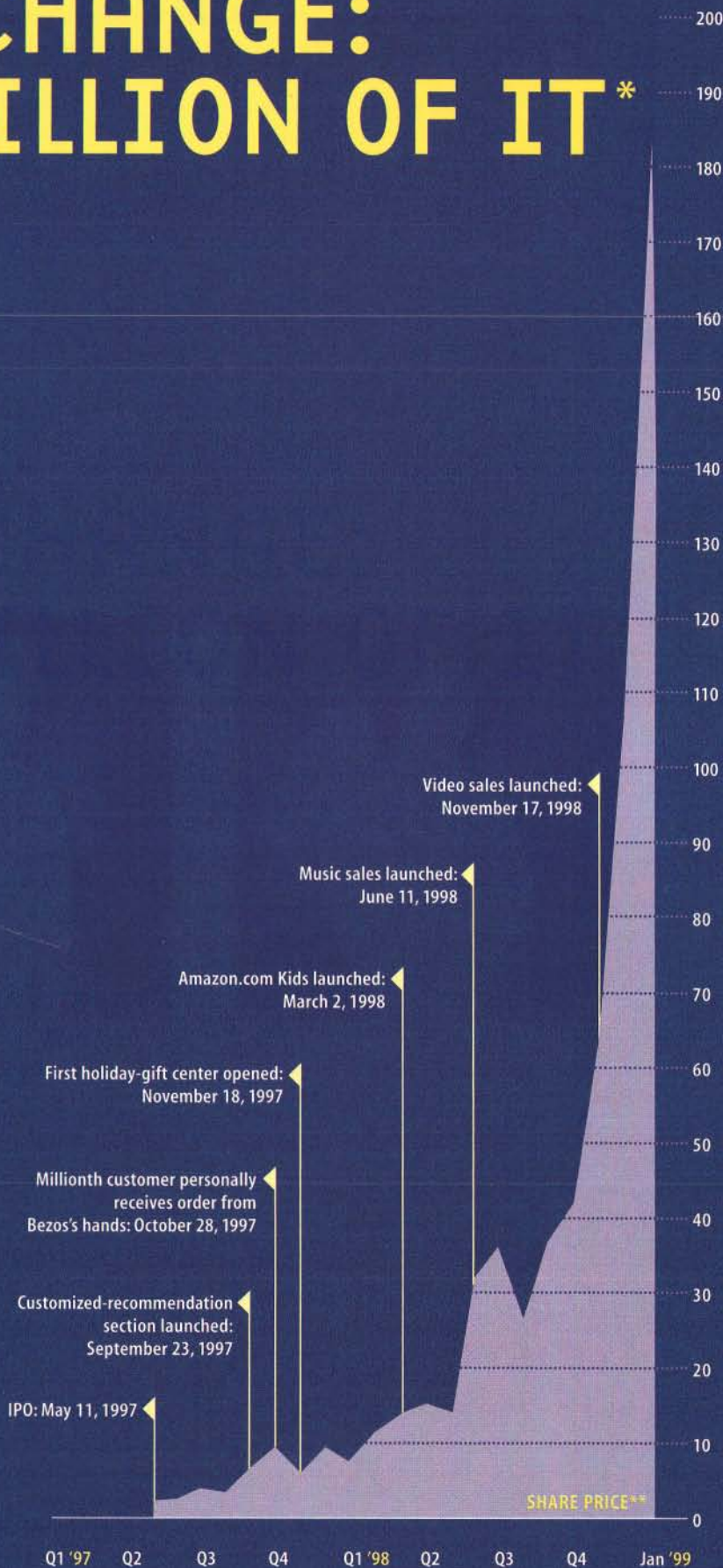
Bookpages:	April 17, 1998
One of the UK's largest online bookstores	
Telebook:	April 24, 1998
Germany's top-selling online bookstore	
Internet Movie Database:	April 24, 1998
Web site for movie and television information	
Junglee:	August 4, 1998
Provider of online database technology	
Sage Enterprises (PlanetAll.com):	August 4, 1998
A Web-based address-book/reminder service	

BOOK REPORT

Title of first book ever sold:	
<i>Fluid Concepts and Creative Analogies: Computer Models of the Fundamental Mechanisms of Thought</i> , by Douglas Hofstadter	
Top-selling title 1996: <i>Creating Killer Web Sites</i> :	
<i>The Art of Third-Generation Site Design</i> , by David Siegel	
Top-selling title 1997: <i>Into Thin Air: A Personal Account of the Mount Everest Disaster</i> , by Jon Krakauer	
Top-selling title 1998: <i>A Man in Full</i> , by Tom Wolfe	
Rank, according to most-sold titles, of <i>The Road Ahead</i> (paperback), by Bill Gates:	3,307
Number of customer reviews submitted:	65
Customer comment: "He didn't even once mention Netscape."	
Rank of <i>Jane Eyre</i> (paperback), by Charlotte Brontë:	9,959
Number of customer reviews submitted:	48
Customer comment: "Rochester is ugly, but he has a mind."	
Rank of the Bible, King James Version (Black Pew edition):	20,133
Number of customer reviews submitted:	4
Customer comment: "Awesome cuz it's all true stuff and interesting (true) stories and advice on anything you could ask for."	

— Compiled by Jennifer Hillner

*as of January 19, 1999 **split-adjusted



"What consumerism really is, at its worst," he adds, "is getting people to buy things that don't actually improve their lives. The one thing that offends me the most is when I walk by a bank and see ads trying to convince people to take out second mortgages on their home so they can go on vacation. That's approaching evil."

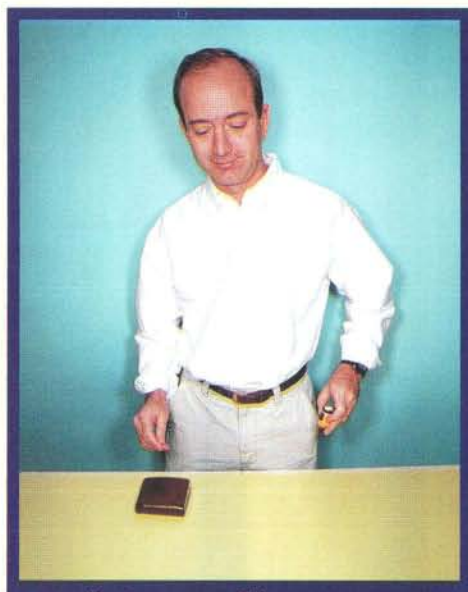
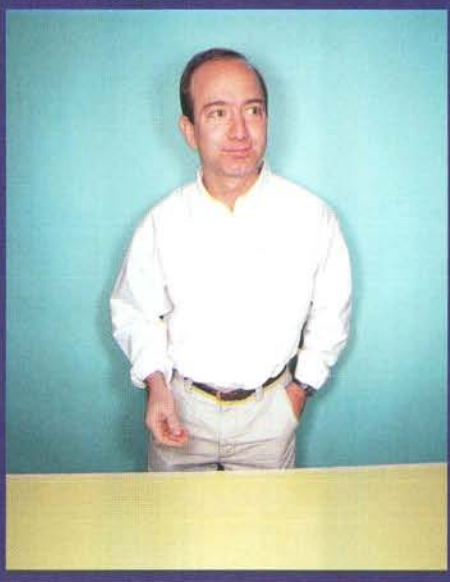
When Bezos describes his primary goals for the Amazon.com interface, he becomes a whistle-stop campaigner for a new politics of consumerism. "We want to turn visitors into customers, and we want to make the experience as welcoming as possible," he says. He insists that the lures and aids Amazon.com provides for its online shoppers – the one-click ordering system that stores credit card and shipping information; the variety of helpful suggestions and information that seem configured to exploit a customer's most impulsive tendencies – are far removed from the world's entrenched consumerist come-ons.

The new merchant, he suggests, volubly and unstoppably, is a community builder, a facilitator, a networker. He cites

Ah-ha-ha-ha-ha-ha!" The laugh, which frequently interrupts conversation, comes out as a long, extended bray, startling the uninitiated. The laugh has become famous, too, yet it only underscores Bezos's ardor. Almost since the beginning of Amazon.com's remarkable rise, Bezos has been characterized as yet another fuzzy-cheeked geek who lucked into an IPO, an uninspired financial technician with a good but not very original idea about distributing goods over the Internet, who would soon be, in the ill-fated phrase of Forrester Research president George Colony, "Amazon.toast." It's a characterization Bezos's competitors have found costly. They may also have missed that, in focusing on the consumer in a way few Web entrepreneurs can match, he is actually trying to transform the world.

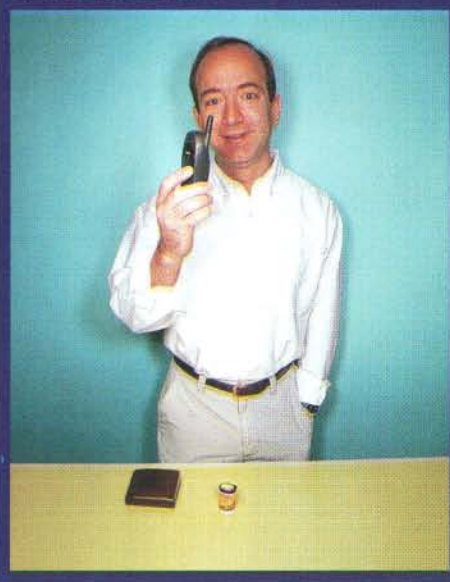
"Jeff always wanted to make a lot of money," says his high school girlfriend, Ursula "Uschi" Werner. She herself was an overachiever – valedictorian of the Miami Palmetto Senior High School class a year ahead of Bezos, winner of a full scholarship to Duke University, and a Rhodes Scholar – but

Whatcha got?



A wallet, some film ...

Nokia 6162 ...



Amazon.com's willingness to post negative book reviews as an example of harnessing the antimanipulative truths the Internet allows consumers to root out. The Net's famously decentralized, open flow of information, he goes on, inevitably deflates the most extravagant hype of traditional retailing. And that shifts the balance of power – which since the origins of department stores and mass merchandising has favored the merchant – back into the hands of consumers. Amazon.com's scheme is, in effect, to form a strategic alliance with all that newly unleashed power.

"This doesn't mean that you can't build a valuable, lasting enterprise in the online environment," Bezos says, "but it does mean you better recognize the environment you're in, and not try to build an airplane to fly underwater.

she remains awed by Bezos's commitment. "It wasn't about money itself. It was about what he was going to do with the money, about changing the future."

Family is important. The Bezos family is extremely close; they actually enjoy spending the holidays together. Reflecting on the source of Jeff Bezos's drive, his closest friends turn inevitably to the legion of family stories, all of which seem to revolve around the theme of hard work and equally hard play.

But within the well-known Bezos family story lies a remarkable story of collective strength.

Mike Bezos is not Jeff's biological father. "I've never met him," Jeff says of the man who is. "But the reality, as far as I'm concerned, is that my Dad is my natural father. The only time I ever think about it, genuinely, is when a doctor asks me to fill out a form." While it's easy enough to theorize that the circumstance of Bezos's birth has had profound psychological repercussions, he responds to questions about it with complete equanimity – if some surprise; his family rarely discusses the matter and even close friends don't know the truth. "It's a fine truth to have out there," he says. "I'm not embarrassed by it."

He recalls that his parents sat him down and told him when he was 10. Whatever their concerns about the possible consequences, they needn't have worried. Jeff describes the moment as not nearly as important or memorable as learning, at around the same time, that he would need to wear glasses. "That made me cry," he says.

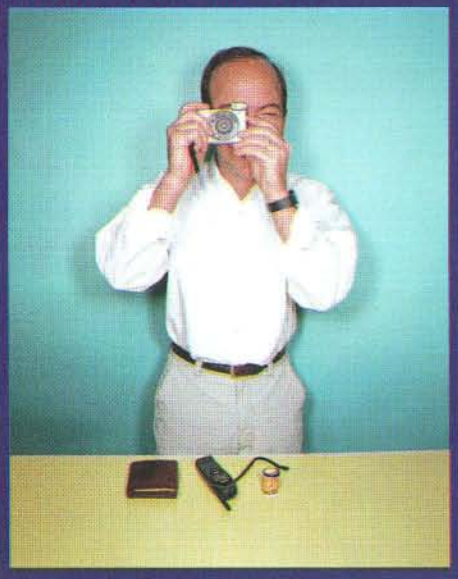
Mike Bezos (pronounced BAY-zoes) had arrived in the United States, alone, in 1962, at the age of 15. He came under

– Mike Bezos still managed to finish his education, then joined Exxon as a petroleum engineer. The family moved several times during Jeff's childhood, from Albuquerque to Houston, then briefly to Pensacola, Florida.

Bezos remembers he always had the youngest parents around. But his friend Joshua Weinstein says that even during their high school years, when she was in her early 30s, Jackie Bezos commanded as much if not more authority and respect than any other mother. She says her values came from her own father, who offered another strong role model for Jeff.

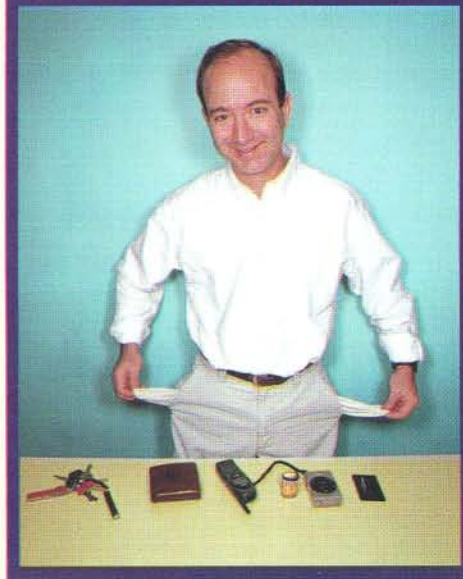
Jeff spent summers working at his maternal grandfather's ranch in Cotulla, Texas, fixing windmills, castrating cattle, laying pipes, and repairing pumps. Lawrence Preston "Pop" Gise had held jobs that a young boy couldn't help but find cool. Gise worked on space technology and missile defense systems at Darpa in the late 1950s; in 1964, Congress appointed him manager of the Atomic Energy Commission's Albuquerque operations office, where he

Canon Elph (smile!) ...



Tool Logic Tool Lite Deluxe ...

World Trade Center Escape Kit.



the auspices of Operation Pedro Pan, an education/rescue program crafted by a south Florida Catholic priest that spirited thousands of teenagers out of Castro's régime during the early '60s. After learning English and graduating from high school in Delaware, where he lived in a Catholic mission with 15 other refugees, Mike Bezos moved to New Mexico to attend what was then the University of Albuquerque.

There, he met Jackie Gise, in a local bank where the two worked. In his freshman year of college – he was 18, she was 17 – they married.

Jeff was born soon after, in January 1964, and Mike Bezos legally adopted him.

With a young family – Jeff's sister Christina and brother Mark are five and six years younger than him, respectively

supervised 26,000 employees in the AEC's western region, including the Sandia, Los Alamos, and Lawrence Livermore laboratories. He retired to his southwest Texas spread in 1968, and he doted on Jeff from the time his grandson was an infant. "Mr. Gise was a towering figure in Jeff's life," says Weinstein.

His grandfather sparked and indulged Jeff's fascination with educational games and toys, assisting him with the Heathkits and the other paraphernalia he constantly hauled home to the family garage. (Picture the scattered components of a robot; an open umbrella spine clad in aluminum foil for a solar cooking experiment; an ancient Hoover vacuum cleaner being transformed into a primitive hovercraft.)

Jackie Bezos's challenge as a parent was to stay a step

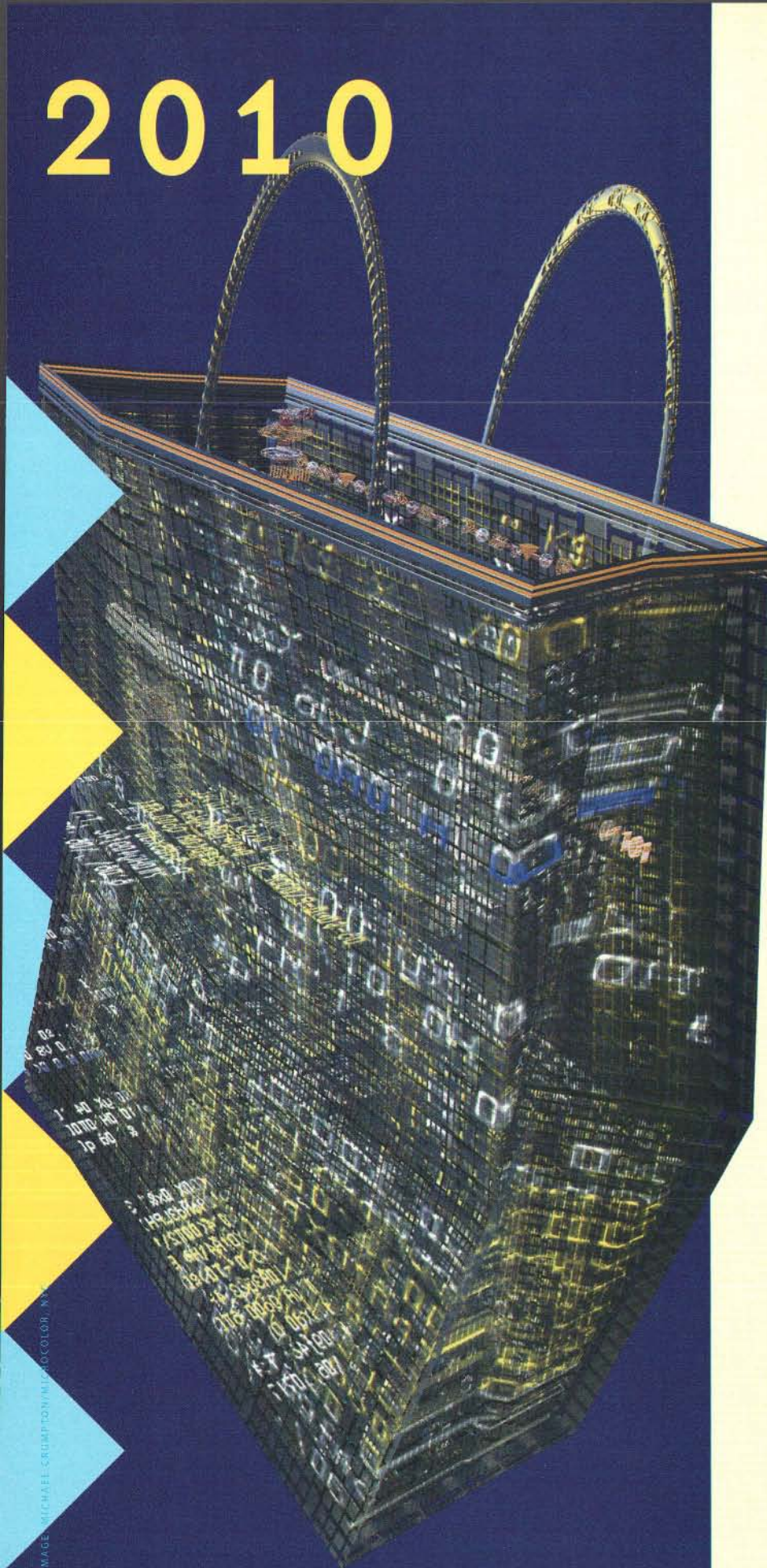
MALL OF AMERICA

As Amazon.com trailblazer Jeff Bezos points out, the Net won't replace shopping in meatspace, it will refocus it. As millions more get what they want cheap, fast, and with a minimum of hassle via the Web, they'll shop in person only because they need it right away (*I'll wear this now, thank you very much*), or because they actually enjoy shopping. This is why retailers seeking repeat business are advised more and more to think in terms of how to enhance the customer's overall experience. (See "The Pleasure Binge," page 86.) Of course, the best mall and store designers learned this years ago from Las Vegas and Boston's Quincy Market.

If it's not too much of a stretch to imagine the physical malls of tomorrow as variations on a theme park, what about the shape of the e-mall to come? What form will it take? The answer lies in five trends already apparent. — *Brad Wieners and Jessie Scanlon*

Trends	1999	2010
Zero Inventory	Buy.com. Onsale. Netmarket. CyberShop. FreeShop ... All share a minimum, or an absence, of inventory. Instead, they collect qualified leads, resell goods other vendors deliver, or rely heavily on distributors. Or, as is the case with Buy.com, they sell goods at a loss, but hope to capture enough eyeballs with super-low prices to make up the difference on ads. Sound crazy? It is. Yet as Hummer Winblad VC Bill Gurley points out, this model need not last to have a lasting impact.	Pundits warn of <i>dismanufacturing</i> as "personal manufacturing machines" — 3-D faxes — come online. Developed by companies like 3D Systems and Z Corporation a decade ago, devices once used for rapid prototyping now enable users to point, click, and rapidly fabricate everyday items. Unexpected houseguest? Punch up a shower cap, razor, and toothbrush.
End-to-End	"There is a tug-of-war going on between maintaining no inventory and controlling distribution," notes Forrester analyst Kate Delhagen. One solution: vertical mergers like the online partnership of bookseller Barnes & Noble, which acquired distributor Ingram, and media conglomerate Bertelsmann, now owner of publisher Random House.	Megacorp competition heats up with fully branded "immersive lifestyle communities." At the Magic Kingdom's new developments, residents' consuming interests are met with everything from bottled Matterhorn Spring Water and Tomorrowland long distance to Disney Kids khakis and <i>ABC Nightly News</i> . It's a mall world after all.
Virtual or Visceral?	Online vendors like Digital River, a leader in electronic software delivery, already move hundreds of thousands of units without package, shrink-wrap, or installer diskettes — just download. Meanwhile, digital playback devices like Diamond Multimedia's Rio are on the fast track to becoming the Walkman of the 2000s. The announced Diamond/Audible MP3 "books on tape" device promises to bring, say, the latest Tom Clancy thriller straight from ether to earphones.	"Virtual or physical?" becomes as common a question at Web supermarkets as "Paper or plastic?" is at Safeway.
Personalization	The first virtual malls were basically catalogs of merchant links, and most died a painful, expensive death. Second-wave e-malls realize they must build up an audience first. They're doing so by getting personal: loading up with special services and perks. And rather than trying to target one user at a time (the one-to-one dream), merchants such as Priceline.com allow customers to advertise what they're after and what they're willing to pay — "one-to-many" in reverse.	Fifty-one percent of all consumer activity consists of services that allow customers to submit what they want and let rival merchants compete for their business — call it a <i>buyer's</i> seller's market.
All-in-One	Look for personal portals to make waves in '99. Consider what PlanetAll.com, When.com, or Jump Networks have in the works. Recognizing that most people plan around a calendar and a to-do list, Jump! — "Microsoft Outlook for the Web" — arranges to have news feeds, sports scores, and other timely stuff you want added to your calendar automatically — including clearance sales on your favorite goods, or new releases from your favorite rockers. (Just don't call it Junk!)	Ecommerce service providers — a.k.a. ESPs — cobbled together from the last century's telcos, cable TV networks, and ISPs offer all-in-one broadband infotainment and expanded shopping services for one low monthly fee. Enjoy <i>Shakespeare in Love</i> ? Please choose from the following: Virgin Atlantic's complete tour package to Stratford-on-Avon, gwynethpaltrow.com , multi-player versions of the Bard's collected works.

2010



ahead of, or at least next to, her prodigy. "I think single-handedly we kept many Radio Shacks in business," she jokes. During his late grade school years, Jeff became fixated on a device called an Infinity Cube, which uses a set of motorized mirrors to allow one to stare into "infinity." But at \$20 it was too expensive to buy, she told him. Jeff figured out that the pieces of the cube could be bought cheaply, so he did – and built it himself. "The way the world is, you know, someone could tell you to press the Button," he said at the time. "You have to be able to think ... for yourself."

The story of Bezos and the Infinity Cube is documented in *Turning on Bright Minds: A Parent Looks at Gifted Education in Texas*. Written by Julie Ray and published locally in the Houston area in 1977 – and, incidentally, not available via Amazon.com – the book follows 12-year-old Jeff (renamed Tim) through a typical day in the Vanguard program at Houston's River Oaks Elementary School, a magnet school that was part of a voluntary integration effort in the city's public school system. Jeff endured a 40-mile round-trip commute each day to attend. The author describes him as "friendly but serious," even "courtly," and possessed of "general intellectual excellence," though, according to teachers, "not particularly gifted in leadership."

He used his brain to compensate. Jackie and Mike, concerned that Jeff wasn't always comfortable with kids his own age, enrolled him in the high-pressure world of Texas youth football. "He barely made the weight limit, and I thought he was going to get creamed out there," Jackie recalls, laughing. Within two weeks, however, the coach had named him defensive captain, because Jeff was one of the few kids on the team who could remember all the plays – not only where he was supposed to be but also the assignments for the other 10 players on his squad.

He completed his personal immersion in the shared world of every American geek growing up in the '70s and early '80s by diving into the deep end of the sci-fi and fantasy pool. When the River Oaks school gained access to a mainframe computer in downtown Houston via a time-share system, he and his friends spent hours on it playing a primitive *Star Trek* game, searching for cloaked Klingon ships in a three-by-three matrix.

By the time he reached high school in Dade County, Jeff had focused on space travel as his future. It wasn't just that he wanted to be an astronaut, like thousands of other kids; as he told friends and acquaintances, he intended to be a space entrepreneur. "Oh, he had ideas about space promotion!" says Bill McCreary, a Miami Palmetto science teacher. Some were drawn from real-life experiences in a high school space initiative he attended at NASA's Huntsville, Alabama, center. But behind the young Bezos's space-station plans was serious intent. "He said the future of mankind is not on this planet, because we might be struck by something, and we better have a spaceship out there," recalls Rudolf Werner, the father of Jeff's high school girlfriend. Uschi Werner still jokes that Bezos's real goal for Amazon.com is to amass 172 ►

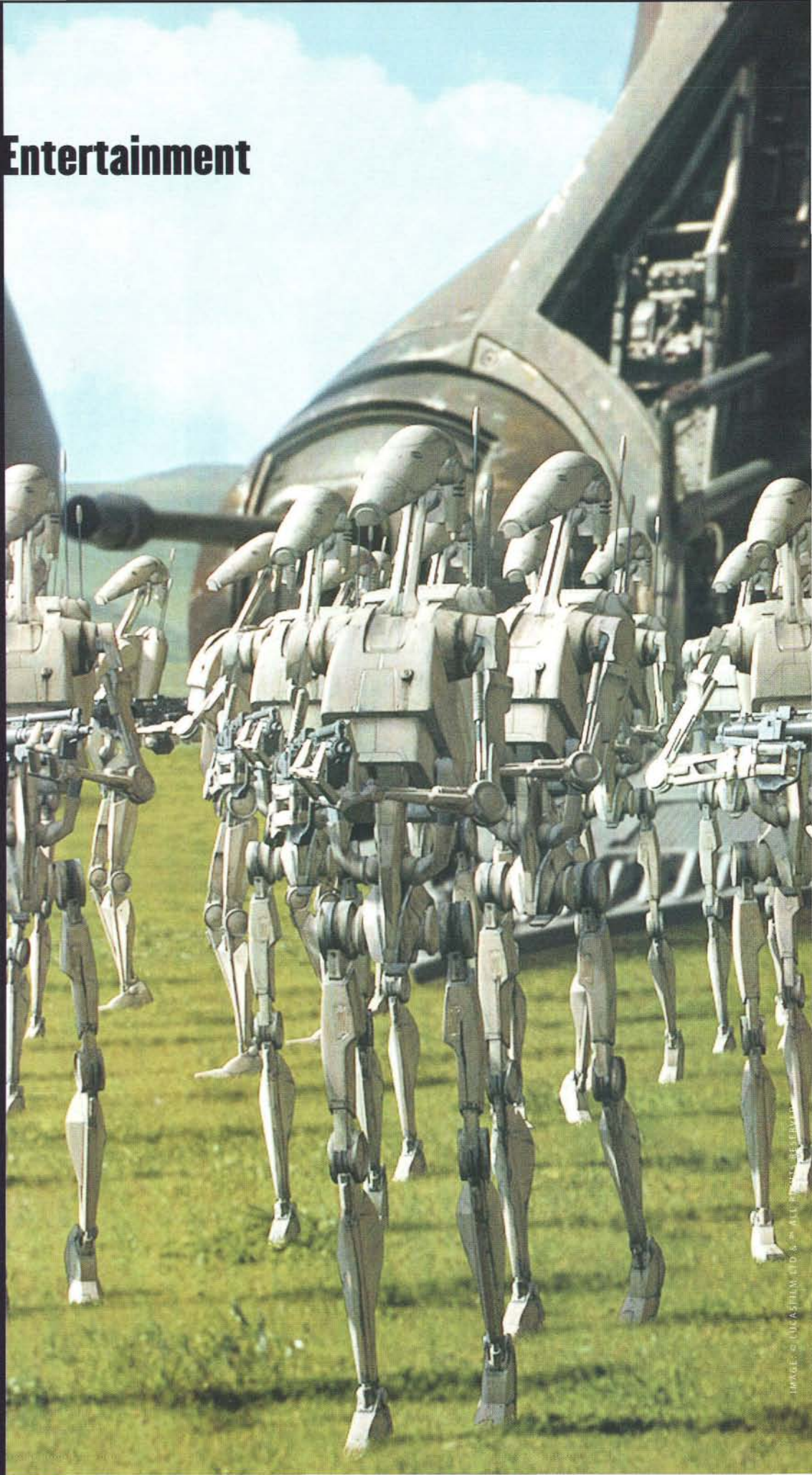
Weapons of Mass Entertainment

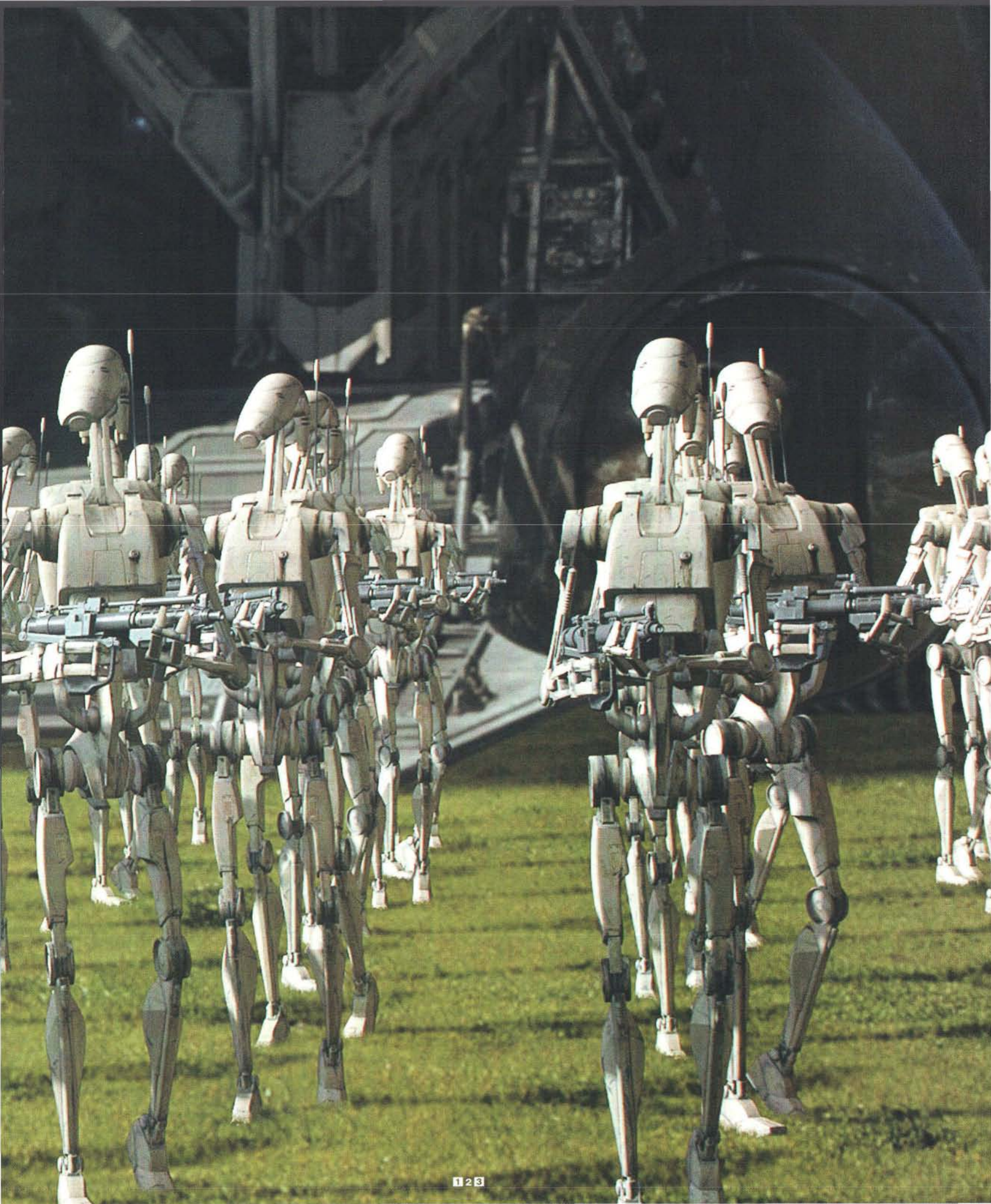
Can you stand it? We have to wait till May for *Star Wars Episode I: The Phantom Menace*, which chronicles the world of the young Anakin Skywalker (a.k.a. Darth Vader). It is a world that will be both familiar and new to *Star Wars* fans. Familiar are the dusty space cowboys, lightsabers, and dented droids. New are the battle droids – the armed and deadly troops of the Trade Federation.

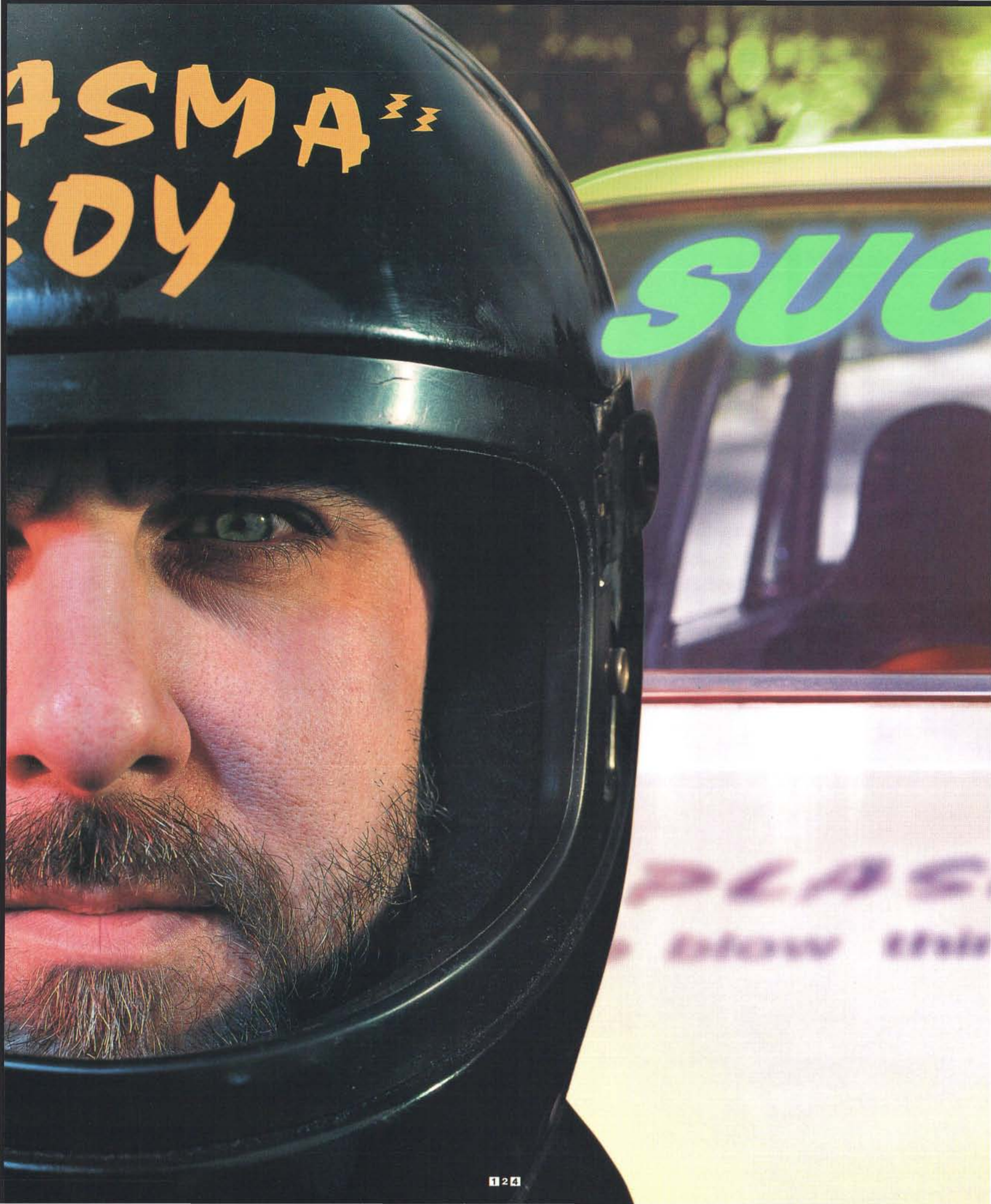
Vehicles, spoons, clothing – every object has been carefully designed to reflect a melding of styles from different eras. These “design elements with a history,” says concept designer Doug Chiang, provide “a background that connects with audiences.”

Animated by ILM, the droids echo the stylized and angular forms of tribal African art, yet suggest the future through their mechanical joints.

“There is a danger in designing the future,” says Chiang. “Things that are too fanciful date very quickly. The future needs a past.” – Paula Parisi







KICK AMPS!

HOW A BUNCH OF SPEED-HUNGRY, RUBBER-BURNING, ADRENALINE-PUMPED ENVIRONMENTALISTS GET THEIR KICKS.

BY CHARLES PLATT

I'm cruising with John "Plasma Boy" Wayland, who has allowed me to drive his customized mint '72 "Blue Meanie" Datsun fitted with a 300-watt sound system and (count 'em) 13 state-of-the-art Optima Yellow Top 12-volt batteries. Wayland loads the stereo with a Bach Busters CD, and Toccata and Fugue in D Minor flows from 10 speakers and 4 subwoofers as we head out from his suburban home in Portland, Oregon.

"Police, they're everywhere," Wayland mutters, sounding like a homeowner complaining about termites, as he eyes a passing patrol car. "Turn right, here." He checks that the cops

are out of sight. "OK, don't bother to downshift, just hit it!"

I mash the pedal. Tires squeal and I get that kicked-in-the-ass feeling as the Datsun leaps forward, ready to do 0 to 60 in around nine seconds. Eerily, there's no roar from the engine and no smoke from the tailpipe. In fact the Datsun has no tailpipe, because those 12-volt batteries don't just run the stereo — they power the entire car.

The Optima batteries Wayland uses didn't exist five years ago; nor did the solid-state controller that moderates their output in the same way a dimmer controls a halogen

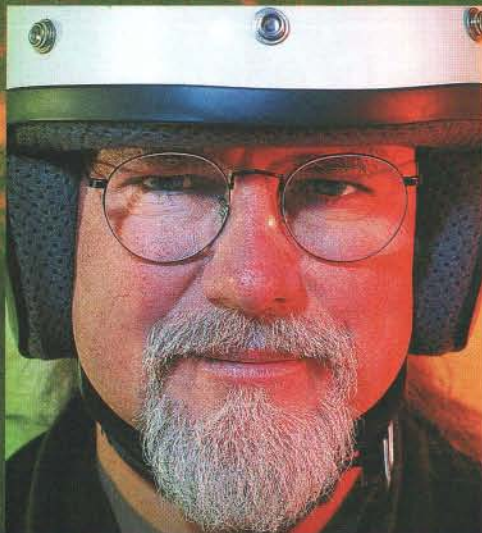
John Wayland and the White Zombie, one of his five electric vehicles.



Dennis Berubé will give \$1,000 to any who can dust him. No one has.



Bob Boyd races a souped-up Toyota. He's 78; it's 135 horsepower.



Roderick Wilde – an amp addict – can hit 140 mph in his Maniac Mazda.

lamp. Modern controllers can handle huge surges of power – up to 1,200 amps at 156 volts in the Datsun. That's 10 times the wattage a typical home would consume with all its lights burning and every appliance running.

But Wayland isn't into power for its own sake; he has a profoundly ambitious agenda. In collaboration with a core group of renegade backyard engineers, he believes he can achieve the goal that has eluded ecofreaks for more than two decades. By rethinking the whole concept of electric cars and presenting them as sexy consumer items, ultimately he hopes to entice millions of Americans to abandon their long love affair with gasoline-powered automobiles.

"I consider myself an environmentalist," Wayland says. "I believe we have to do something about internal combustion engines. But environmentally conscious people deal in guilt and want us to feel bad. I don't accept that. I say, build an electric car that is exciting and fun and gets your adrenaline pumping, and then people will *want* electric cars."

His tactics haven't made him popular. Anna Cornell of the Electric Auto Association, which has been promoting electric vehicles since 1967, sounds vexed and edgy when Wayland's name is mentioned. "People like him are a little on the wild side," she says, trying hard to be nice about it but suggesting that his excesses seem a gross violation of the usual conservationist ethic.

In fact Wayland has been pissing off environmental special-interest groups for more than 15 years. Back in 1984, at an electric-car rally, he

recalls, "I was in my gleaming, beautiful vehicle with the stereo cranking, and they said, 'Wait – what are you doing here?' They thought I was in the wrong place because my car didn't have duct tape and wires hanging out of it, and didn't look like a rolling science project. They said, 'Where are your batteries?' I told them that was the whole point; I didn't want people to see any batteries. I mean – it's supposed to look like a *car*."


Adding outrage to insult, Wayland demonstrated the low-end torque of his DC motor by smoking his tires, choking spectators with localized air pollution. The ecofreaks were not amused. "They don't want you to have fun," he complains. "They want you to drive a three-wheeled cockroach that goes 35 miles an hour and if you get hit by a motorcycle, you're dead. No radio, because that's fun. No carpeting, because it might be some animal fiber. Well, we're not going to play their game anymore. We are starting a new game."

Now 47, Wayland taught himself auto engineering by building gasoline-powered hot rods as a kid. "My brother had a 327 Corvette, and I had a '55 Chevy that was hopped up. But also I worked with electricity – I always had battery-powered toys. I could see that electricity could be the way to go."

In 1980 he took the first step: electrifying his salvaged Datsun. Initially he used just eight 6-volt batteries, and his own controller. "I had shrapnel all over the walls when it blew up," he recalls.

After perfecting the controller, Wayland grossly underestimated its power throughput when he tried to back out of his driveway. "I twisted the drive shaft, broke an engine-mount bolt, and cracked

Contributing editor Charles Platt (cp@panix.com) wrote "What If Cold Fusion Is Real?" in *Wired* 6.11.



**"I cover the first 60 feet
in 1.3 seconds. There's
so much torque from the
motor, it cracks gears."**

**Dennis Berubé blows
away the competition in
his Current Eliminator III.**

**Electronerds race machines
crammed full of batteries
that deliver surges of power
up to 1,400 amps.**

*Don Crabtree, aka Father Time,
holds the world speed record for
electric motorcycles.*

the transmission case, leaking fluid for 20 feet. Plus, I burned rubber all the way into the street."

When the damage was fixed, he managed a test run – and was pulled over by the police.

For more than a decade Wayland remained an electrified radical lost in the smog, with few disciples. Finally, in the 1990s, the rest of the world started to catch up with him. In Phoenix, auto-racing enthusiasts Mike Shaw and Don Karner rented a track and staged the world's first all-electric drag race, which became an annual event. Wayland entered it in 1996 with another '72 Datsun, named White Zombie after the heavy-metal

band. This car used an experimentally modified forklift truck voltage controller – which turned out to be dead on arrival, leaving him with no way to moderate the power. In desperation he switched the full battery voltage with two huge relays, so that the car was either "on" or "off." "I burned rubber in all five gears," he recalls, "and won first place in my voltage class."

At the same event, General Motors entered the prototype of its electric vehicle, the EV1, which the company raced against another amp-hungry maniac: Roderick Wilde, a tall, bearded, long-haired, leather-clad figure who looks more like a

biker gang member than a race-car driver. In fact, he rides a big Suzuki motorcycle, and sometimes wears a black beret with "Born to be Wilde" hand-embroidered around the edge.

Wilde had already racked up his own string of dubious achievements. "My first race was in 1993," he says, "in the Solar & Electric 500, sponsored by APS [Arizona Public Service Company, an electric utility]. We went so fast they eliminated our race class because it was too dangerous."

At the 1996 drag races, Wilde adds, "the announcer got my name wrong and the name of my car wrong, but I beat GM's car by two whole seconds."

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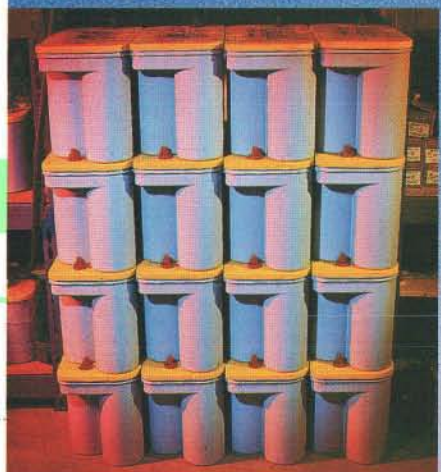
BIG AUTOMAKERS VS. BACKYARD MECHANICS

	Seats	Horsepower	Max Speed (mph)	0-60 (seconds)	Range (miles)	Price
Wayland's Blue Meanie Datsun 	4	130	120+	8-9	35	\$8,000
Wilde's Maniac Mazda RX7 	2	450	140 (estimated)	4	30+	\$35,000
Boyd's Toyota MR2 	2	135	100+	10	40	\$18,000
General Motors EV1 	2	137	80	9	80	\$34,000 (3-year lease)
Chrysler EPIC minivan 	5	100	80	17	85	\$16,200 (3-year lease)
Honda EV PLUS 	4	66	80	18	70	\$455 (monthly lease)
Toyota RAV4-EV 	5	67	78	17	118	\$22,500 (estimated)
Toyota Prius (hybrid) 	5	97	100	13	850	Undetermined

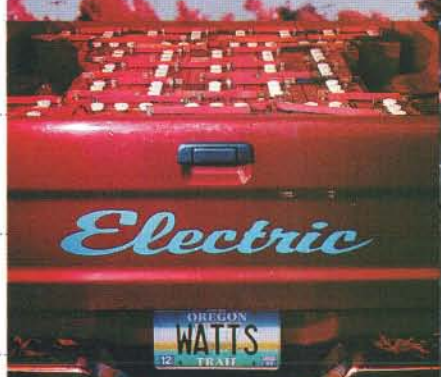
Price of home-converted cars is their replacement cost, without special paint jobs or fancy stereos, and does not include labor. Wilde claims that one-third the cost of his Maniac Mazda is in its motor-speed controller. Range for all vehicles is averaged between highway and city usage, and 0-60 time is rounded to the nearest second. Horsepower for the Prius is the combination of gasoline engine and electric motor. Wilde's Mazda has an estimated range and an estimated top speed, since he hasn't found a location where he can run it flat out. Wayland's Datsun also has an estimated top speed because the speedometer stops at 120.



Godzilla, the beast, atop the Godzilla motor-speed controller in Wayland's White Zombie.



Wayland's version of a garage start-up: Optima batteries.



The Red Beastie, another Wayland EV, travels 150 miles per charge.

Intel used to operate under the principle that you could have any chip you wanted as long as it was black," Karen Alter, the company's director of microprocessor marketing, says with a smile. How times change.

Faced with declining profits (down 13 percent over 1997), Intel is revamping its business model. No longer can it confidently introduce a new high-end – and high-priced – microprocessor and rely passively on more complex software to spur demand (as Windows

Intel's answer to a world in flux? Phase out Pentium II, and bring on Celeron and Pentium III, belle of a raucous February rollout.

Intel's Celeron line – which is both cheaper and more powerful than it would have been without credible competition from AMD or Cyrix – costs Intel about \$65 to make and sells for as little as \$71, according to Sunnyvale-based MicroDesign Resources. Numbers like that will hardly support the company's historic 60 percent gross profit margins. For that, Intel needs the Pentium III – which, costs about \$73 to manufacture and will go for nearly \$700. The new Pentium comes in 450- and 500-MHz versions, and Intel claims it gives you the same horsepower multimedia professionals get from SGI workstations. More than 200 software vendors and Web developers have Pentium III-friendly software in the pipeline.

"The reality of the market today is that there's a lot of volume selling at prices below \$1,000, but there's still a lot of volume at higher price points," says Alter, one of the chip giant's vice presidents. "There really is a market for this."

Decision time: Upgrade to the Pentium III, or scale back to the Celeron? If you're wondering whether the III is nothing more than its predecessor with tailfins, you'll want to consider the basics. Here's the lowdown, spec by spec. – Niall McKay and Todd Lappin

CHIP TEASE

INTEL ROLLS OUT THE PENTIUM III

95 did for the original Pentium). Now killer apps are Internet related – more bandwidth-suckers than processor-hogs – and consumers are bypassing \$2,500 PCs in favor of dirt-cheap econo-boxes. In November 1997, the chipmaker's share of the sub-\$1,000 PC market was 65.7 percent; in November 1998 it was 31.7 percent.

Instruction set

The instruction set tells the processor how to execute specific commands. All Pentiums use the x86 – the Pentium II was one of the first to run on top of Intel's P6 microarchitecture.

Clock speed

333 to 450 MHz
Intel built its rep by pushing the clock-speed envelope. And at 450 MHz, the Pentium II has long been the fastest one out there (though Apple's G3 is now closing in fast). It's that 450 MHz that let's you zip so deftly around the Windows environment.

Clock speed

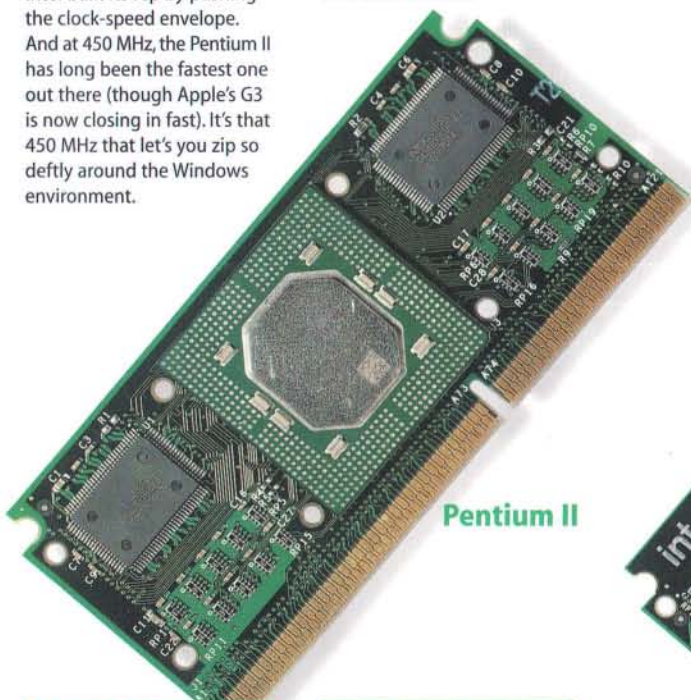
300 to 400 MHz
The 366-MHz Celeron is only 5 to 10 percent slower than an equivalent Pentium II. It packs 128K of onboard cache (storage space built onto the processor), which is more efficient than the Pentium II's 512K of closely coupled cache. For Web surfing and wordprocessing, the Celeron's plenty speedy.

Instruction set

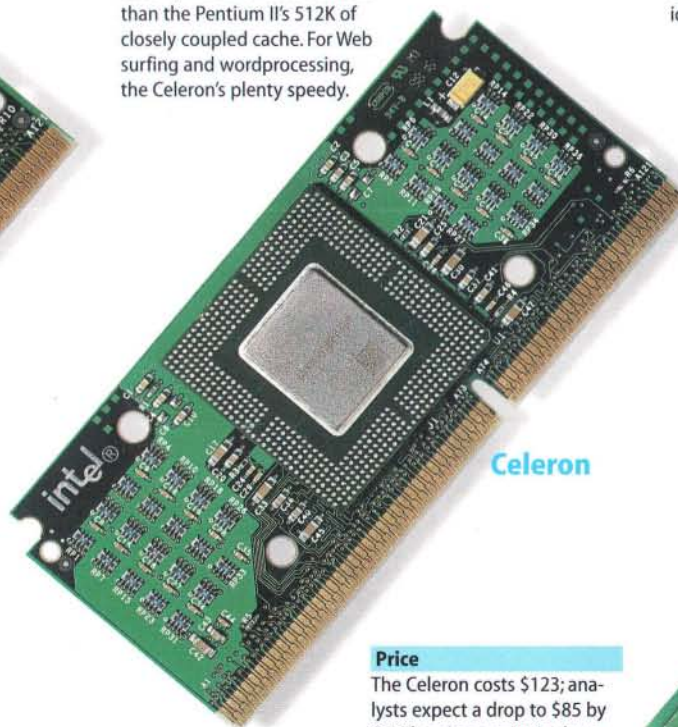
The Celeron uses the same instruction set as the Pentium II. But next year, Intel will introduce the Pentium III instruction set to Celeron for a souped-up but still reasonably priced chip.

Multimedia enhancements

Like the others, Celeron has the MMX instruction set, designed to run video, graphics, and game apps.



Pentium II



Celeron

Multimedia enhancements

Intel designed MMX (multimedia extensions) to help the Pentium II run multimedia software. (MMX is included on all three chips.) It assists with integer calculations typically used for compression and decompression of video.

Price

As of January, the Pentium II was priced from \$181 (333 MHz) to \$562 (450 MHz). With the processor being phased out this year, there are no second-quarter prices yet.

Price

The Celeron costs \$123; analysts expect a drop to \$85 by Q2. There's no point in dumping your Pentium II until the Celeron includes the Pentium III instruction set (see above); then consider the as yet unannounced 500- or 600-MHz Celerons.

Instruction set

The Pentium III couples its own instruction set with the Pentium II's. The new set enables software developers to represent objects as mathematical equations and easily translate these into images. The new chip processes up to 2 billion floating-point calculations per second, double that of the fastest Pentium II. And because such calculations are used for speech synthesis and pattern/voice recognition, the Pentium III is a better chip for handling encryption.

Multimedia enhancements

The secret to the Pentium III's blazingly fast multimedia is the new instruction set's 70 SIMD (single instruction multiple data) extensions for floating-point data types. The Pentium III provides more realistic graphics with smoother surfaces, as well as real-time rendering of shadows and reflections.

Clock speed

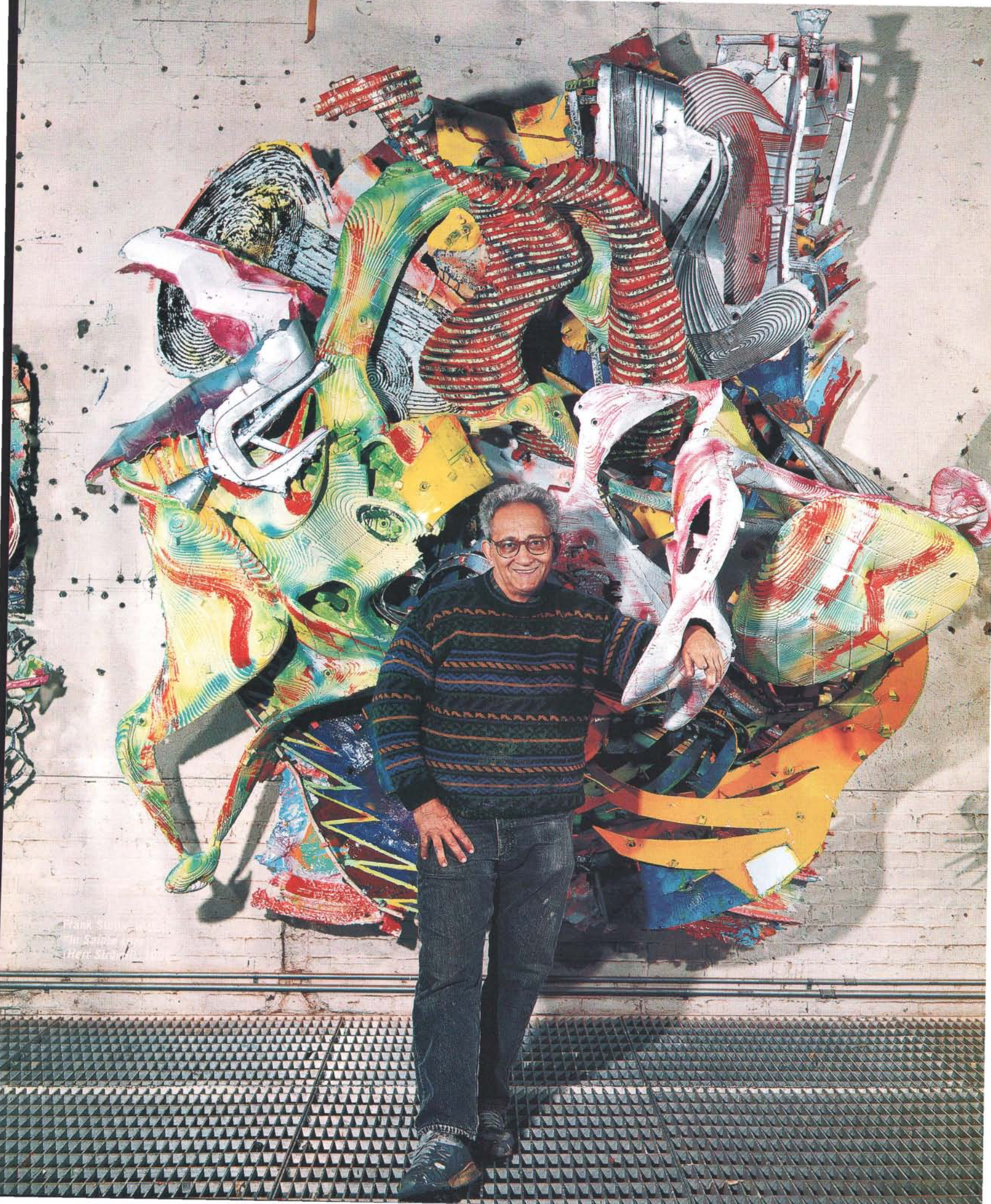
450 or 500 MHz

Although the new processor makes very little difference when running applications not designed for it, many of tomorrow's coolest apps will need the Pentium III (or AMD's similar 3DNow! chip) to run properly. And if the speedy 500 MHz just isn't enough for you, wait until the second half of the year, when Intel will shrink the die size to 0.18 microns to build a 600-MHz version. Experts believe that by year's end Intel will be well on its way to producing a 1-GHz processor.

Pentium III

Price

The 450-MHz Pentium III processor costs \$496, the 500-MHz version \$696. Prices are expected to drop fast, reaching \$350 and \$530 by the second half of the year.



Frank Stella
in Salina
Herr Street

By Steve Silberman

Stella

The modern master stokes art from smoke,
plus a G3 and some off-the-shelf imaging software.

There's a zone of intensified chaos across the street from Frank Stella's studio, located in a converted carriage house a block off of New York City's Union Square. One of the urban temples of Dionysus that packed in acolytes during its heyday from the dawn of acid to the twilight of the acid-washed is being torn down. A huge crane grinds in a swirl of brick dust, adding debris to a mound of twisted rebar and girders waiting to be hauled away by a truck emblazoned with the accidental poetry one finds all over Manhattan: "Sky Materials."

Stella is looking down from his second-story window at the busyness in the lot, still radiating a bantamweight's alertness in his sturdy Sicilian frame at 62. When I make the over-obvious comment that the heap of hard-hat detritus bears a resemblance

Contributing editor Steve Silberman (digaman@wired.com) wrote "Ex Libris" in Wired 6.07.

to the medusas of steel pipes, flanges, and dented rusty tanks that Stella welded together in the early '90s – like the 15-foot-tall *Yawata Works*, built in seven days to advertise a recycling program in Japan – Stella responds with the unswaggering assurance that is his signature: "We have this world completely covered. We've already done it."

Forty years after Stella rewrote the rules of contemporary art with a series of monolithic canvases known as the Black Paintings, the scope of the world that he can claim to have covered is still widening. The effect of the Black Paintings – the pioneering works of modern minimalism – was a reboot of the culture's visual imagination, which had been staggering to find new footing in the wake of Jackson Pollock's detonations of poured and splattered paint. Though the pictures in the Black series seemed rigorously stark compared with the work of those who clambered after Pollock's hectic example, Stella's lines possessed an unmistakable

vital energy, like tracers of strange new isotopes through a cloud chamber. By dialing everything back to pinstripe geometries of unpainted canvas on a black field (Stella was actually disappointed when a critic perceived depths implied beyond his surfaces), he transmitted a binary pulse to a generation of artists through the static of his era – and the signal was “more life.”

But even those who recognized that the brush paths of the Black Paintings led into the future couldn't have guessed how florid and defiantly unminimal Stella's transmissions would become. After the mid-'70s, Stella's straight edges and compass-drawn radii erupted in insurgent colors, free-drawn curves, and restless, asymmetrical forms. Coils of fiberglass and aluminum writhed off any single picture plane, and op-art cones and pillars inspired by a 19th-century stonecutter's text thrust toward the viewer, obliterating distinctions between painting and sculpture.

By intermingling French curves, chicken wire, graph-paper grids, scraps of fiberglass and magnesium rescued from the studio floor, and Day-Glo colors scrawled with the unself-conscious vigor of a kindergarten scribbler (one of Stella's series in the early '80s was called *Playskool*), the painter who had titled a black-and-white labyrinth *The Marriage of Reason and Squalor* pushed through to new kinds of astonishment by wedding chaos and order.

It was only a matter of time before Stella discovered a tool that could deliver inexhaustible supplies of both order and chaos into his studio: the computer.

Like many of us, Stella was drawn into the world of bits by means of one of his favorite ways of passing time.

In the winter of 1983, Stella was invited to deliver the prestigious Charles Eliot Norton lectures at Harvard. Stella's now celebrated talks focused on conceptions of space in art, from Caravaggio to Pollock and beyond. He had been put up in a well-

heated “master's apartment,” and one night, unwinding alone after a lecture, Stella indulged one of his vices, a taste for Cuban cigars. As Stella drew in the draughts of rich smoke, he noticed that the air around him seemed exceptionally stable, a perfect opportunity to savor a gloriously nonproductive activity: blowing smoke rings.

“It was very still in the room, and there was just one light source,” Stella recalls. Watching the blossoming transit of ghostly symmetries in front of him, he could see right away that puffing smoke rings could be a way “of making imagery, of creating shapes that I hadn't seen before – a kind of Faustian fantasy.” But how to trap the fleeting liquid architectures in art?

That was a question that would simmer until 1990, when Stella was making a series of prints with titles taken from the 135 chapters of *Moby Dick*. Stella treats shapes the way a jazz musician works certain riffs – as points of return and departure – and a new

figure that Stella called “the wave” had come into his art with a series inspired by an illustration for a traditional Passover song by the Russian constructivist El Lissitzky. He'd originally intended to call his Melville-titled series *Fractals*, having been fascinated by the provocative pop-science best-seller that had the unfortunate legacy of turning the Mandelbrot set into the lava lamp of the '90s: James Gleick's *Chaos*. (Thank goodness Stella also stumbled over a copy of *Moby Dick*.)

While he was musing in fractals and waves, it seemed time to revisit the idea of sculpting smoke. Stella had two comrades-in-art at his studio, Earl Childress and Andrew Dunn, who had both come into the artist's life for eminently practical reasons. Childress's teenage art hero was not Stella, but Andy Warhol, who Childress says he admired for “staying ahead of every question.” Childress signed on in 1979 as the general contractor for the renovation of Stella's studio and stayed on to design an apartment for the artist's sister in an adjacent building. Dunn, a gifted young cinematographer, was hired in 1990 to sweep the floor. Soft-spoken and self-effacing, Dunn says his plan was to “learn while you earn.” They both ended up becoming invaluable collaborators in the cottage industry of making Stella's art.

Childress and Dunn constructed a device for freezing the flow dynamics of smoke in mappable form: an 8-foot-square enclosed box, lined with black cloth and lit by four bulbs, with stop-action cameras on every side focused into the center. Drilled into two of the vertical edges were holes through which Stella could exhale Cuban chaos into the space.

It worked. Stella puffed and pursed his lips, the six cameras fired simultaneously, and, like God's own Heraclitean snowflake factory, near randomness was harnessed into a production line and unrepeatability was made reproducible. Soon, the Stella team had

thousands of photographs of smoke rings. Using off-the-shelf programs like *Illustrator* and *Photoshop* – and, later, more sophisticated 3-D imaging packages such as *form-Z* and *Alias|Wavefront* – Dunn and Childress turned the complex swirling forms into files and maps. “My approach was to study vortex systems and flow dynamics,” Childress recalls. “Frank's issue was the image.”

Some of the photographs and printouts were shipped to Sweden, where Stella has a connection at AB Tumba Bruk, one of the few producers of the superfine line engravings used on most of the world's paper money. The presses at Tumba Bruk aren't supposed to be employed for anything but banknotes, but if you look at Stella's work over recent years, you can see what his friend has been clandestinely running off on those precision presses at night: the same crystalline webs that lace the bills in your pocket – but folded, stretched, twisted on themselves, brought into the visual currency of Stella's universe.



From the time when he was painting, Stella has been fascinated by the idea of sculpting smoke.



Stella's latest inspiration began with a Cuban cigar. He could see right away that puffing smoke rings could be a way of "making imagery, of creating shapes that I hadn't seen before – a kind of Faustian fantasy."

A photograph of two men standing in front of a large, curved wooden crate. The man on the left, Andrew Dunn, is wearing a light blue and grey work shirt and dark jeans. The man on the right, Earl Childress, is wearing a dark purple long-sleeved shirt and dark trousers. The crate has various markings, including "LAP #5905", "OPEN THIS SIDE", "KEEP DRY", and "PACKED BY CROZIER NEW YORK".

Stella's ambassadors
in the digital domain:
Earl Childress (right),
once his general
contractor, and
Andrew Dunn, hired
in 1990 to sweep
floors, are now
inextricable from
the artist's process
of invention.

Stella, whose tireless work ethic makes him an omnivore of source materials and images, didn't stop with smoke rings. The shelves of his studio are piled four feet high with prints and printouts, shards of already-used forms – scaled up or down – that will be recycled into new work. (*Art in America* critic Carter Ratcliff once dissed Stella's compulsive repurposing of his own riffs, calling him an "image administrator.") Now, even lumps of clay and the luminous ephemera of soap bubbles are scanned in and plotted – their accidental poetry, too, added to the library of forms available to Stella's eye and hand.

It's not the artist himself, however, who puts in the long nights at the G3 and the other machines lined up on a rack on the studio's first floor. Stella admits he can't type (his left hand was mangled by a falling concrete urn when he was a child), and Dunn says Stella never touches the computers. As Childress explains in characteristically elevated language, "Frank's ambition seems to be to transform the object into the specific condition of the work of art at hand. Our job seems to be to produce the materials."

Or, as Stella puts it with characteristic directness, "We use the things [computers], and I never think about it. I yell at Andrew and say, 'I want to do this.'"

For a long time, Stella wouldn't even stand in front of the computers while the images were being manipulated, preferring to dictate instructions based on printouts – even on two-dimensional screenshots of three-dimensional models. Stella germinated ideas for collages in physical space, and Childress and Dunn articulated and refined them in cyberspace; but they had to be brought back to the world of atoms, volume, and mass before Stella felt comfortable working with them. "He was almost afraid," says Childress. "You'd have to let him look at the piece of paper. But I just got tired of outputting color images.

Now I make him come down and look at the screen."

As Stella's ambassadors in the digital domain, Dunn and Childress perform functions as indispensable as those of Stella's long-time collaborator Ken Tyler in the making of his prints. And as Stella's ever more ambitious projects have required the manipulation of forms and ideas in virtual space to become more elaborate, the roles of Stella's assistants have become inextricable from the process of invention.

When Stella was commissioned in 1992 to provide murals for the Princess of Wales Theatre in Toronto, the scope of the project quickly widened to placing images at the end of each row of seats and in the stairwells, foyers, and lounges, mounting bas-reliefs around the dress circle and backlit murals above the proscenium, and, most spectacularly, installing a ring of forms around the central dome in the ceiling. For the images encircling the dome, Childress scanned an X-shaped collage of Stella's, copied it several

times, and then mapped the images onto a virtual representation of the quarter-torus surface of the ring. ("If you were doing that on paper, trying to cut the paper small enough, you'd never get it to look right," says Childress.) Then the 3-D model had to be transformed back into flat images, which were made into slides that were projected onto the actual surface of the dome so they could – finally – be painted in place.

As the projects have swelled in scale, the problems of mapping bits to atoms have also increased, since forms perfected on the screen can turn out to be clunky when they're transplanted out of the box at one thousand times the original size. But Stella – who once critiqued a Whitney Biennial by saying it "lacked failure" – is remarkably undaunted by projects that don't work out.

Irving Sandler, who profiled Stella extensively in his *American Art of the 1960s*, says it would be difficult to imagine Stella's recent art without digital assistance: "To devise one of Frank's pictures now without a computer would be an endless process."

Childress says that he's been showing around a computer design for a building in Paris and calling it "a Stella," though

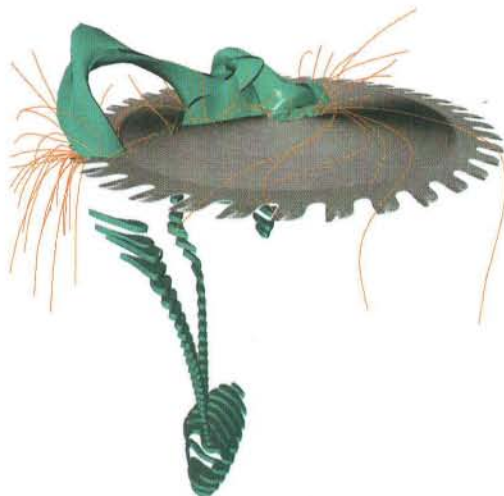
most of the fleshing out of Stella's original idea has been done in virtual space by himself, artist/programmer Alex Cot, and engineers Peter Rice and Martin Francis. He's pragmatic: "If you call it a Stella, everyone gets interested in it."

There's no doubt, however, that even the works that have spent the most ripening time in the ether are Stellas, expressive of the artist's spirit and aesthetic that has, over the course of four decades, expanded beyond the bounds of a single consciousness. Stella's studio itself – from the thousands of paint cans on the tables to the beige machines downstairs to the stacks of art history and math theory that bury Stella's desk to the explosions on the walls awaiting the airbrush or torch – is a prolific

ecosystem, a big mind that thinks in collages.

Now that the little mind of silicon has been harnessed by artists to do everything from plotting the arcs of Merce Cunningham's choreography to uncovering the fact that some of Pollock's most startling lines were inscribed with a brush, Stella's still doing what he's been doing since 1954: making judgment calls by eye in a room that smells like solvents and machines and pumps out beauty that changes the way people see.

I asked art critic and diarist Robert Pincus-Witten what he thought of Stella adding computer imaging to his process of making art. "From the outside, it seems fascinating, this artist using extremely hip technology. Isn't that hip? Yes," Pincus-Witten observed dryly. "But essentially, the technology is no more interesting than a hairy stick. At one point Frank was comfortable with brushes. Now he's interested in technology. Everything is a pencil. If that's his pencil, that's his pencil." ■ ■ ■



Imagined tent, like form2 allow visions and structures that constitute the work's ring into "a Stella."

A close-up, high-contrast portrait of Chuck D, the lead rapper of Public Enemy. He is looking directly at the camera with a serious, intense expression. He has a short beard and mustache, and is wearing a blue headband. The lighting is dramatic, highlighting the texture of his skin and the intensity of his gaze.

ListenUp

Chuck D has some **choice words** for the pimps in the music industry.

By Jesse Freund

Wired: Why did you decide to post songs to the Web in MP3? You knew PolyGram, which owned the tracks, would object.

Chuck D: Major record labels are like dinosaurs. They move slow. Our album *Bring the Noise 2000* was slated for a March '98 release, but PolyGram slept on it. So we released it in MP3 on our supersite. Why not? Our fans wanted the music. And we believe in the technology. We didn't sell the tracks, so to us it was the same as just making more promotional copies.

Your label thought otherwise.

Yeah, the lawyers came running and told my manager to take it down. They don't like MP3 because it can obliterate the middleman. But the industry won't be able to pimp MP3, so they're going to have to figure out how to co-opt it.

And the Recording Industry Association of America is already on the march. Does its anti-MP3 format, the Secure Digital Music Initiative, stand a chance?

No. The dam has burst, and the chunks are in the water.

Could be – Billy Idol and the Beastie Boys have had similar run-ins over unauthorized Web releases.

It's the chicken coming home to roost, the leveling of the playing field, the little man getting his chance.

And what will the little man do with all his new power?

Soon you'll see a marketplace with 500,000 independent labels – the majors can co-opt all they want, but it's not going to stop the average person from getting into the game. Today a major label makes a CD for as little as 80 cents, then sells it wholesale for \$10.50 so retailers can charge \$14 – that's highway robbery. They were able to pimp that technology. Well, MP3 is a technology they can't pimp.

Yet the industry says it's a technology that promotes piracy.

Look, this is what I do because the shit has hit the fans. We're already making a big move with MP4, which compresses files more. You can email tracks.

How does all this affect the music being made today?

There's incredible, diverse talent. But the way radio, retail, and record companies govern the music is whack – playola, payola, and censorship turn artists into one-track ponies.

Can the Net change the way big music does business?

Say an independent label has a studio. If this label cuts a record, it has to go out and distribute 10,000 pieces of hard-software in order to get exposure. The Internet eliminates that need, so an independent can test a market without ever pressing a CD. The demo, as we know it, will be eradicated.

What will this mean?

You'll see \$3 albums, which artists won't mind if they're getting the money. And the public will ask, "Shit, I can get 25 songs off the Net and make my own CD – or have a Real-Player in my car – why the hell should I spend \$14 at a store?"

The true revenge will come when the major labels start dropping their prices. I can see the public saying, "OK, I could go to the store and pick up the album I want for \$5, but I can get it on the Net for fucking \$3."

Good for the consumer, but is it good for the musician?

It's great for the musician. Instead of just depending on a song and a video, the Net will bring back live performances. Artists will be able to release a song every two weeks, instead of waiting six, seven months for a label to put it out. A band can become like a broadcaster.

How so?

We have our site. We recently launched the *Bring the Noise* online radio show. Our Rappstation online radio station, which hopes to be the ESPN of hip hop, is coming. And we just started Slam Jamz, the affiliated superinteractive label.

Affiliated superinteractive label?

It's going to be a label on the Web that people can download music from. We should have a good stable of artists by 2002, and then we'll release singles like crazy. We'll also offer videos that people can burn to disc. That's my vision. There are Web sites, there are supersites, and we're trying to be a superstation.

Why a superstation?

A Web site – whoopdee, my mom's got a Web site. A supersite has a lot of traffic and capability for streaming and commerce. A superstation will be interfaced with television, so you can get real-time feeds. For a consumer, it's about getting what you want fast. *Blam*. Then who the fuck needs radio or network TV?

What about the Microsoft trial – should they shut down Mr. Bill, or let him play his game?

When someone comes along and dominates an industry, of course you get a whole bunch of losers screaming, hoping somehow they can beat 'em down. Show me a good loser, and I'll show you a loser. Bill Gates is Michael Jordan.

Still, people complain the new tools are dividing society. Are we seeing the birth of a nation of information have-nots?

Computers will be available to everyone. They're getting cheaper, and in the environment I come from, if you don't got it, you borrow it – "Let me come over and make a CD." There's a community that will network this equipment. When people start talking, "In the black community there aren't any computers ..." Wasn't long ago there weren't cell phones or pagers, and now they run abundant. It's only a matter of time before someone will jack you for your laptop.

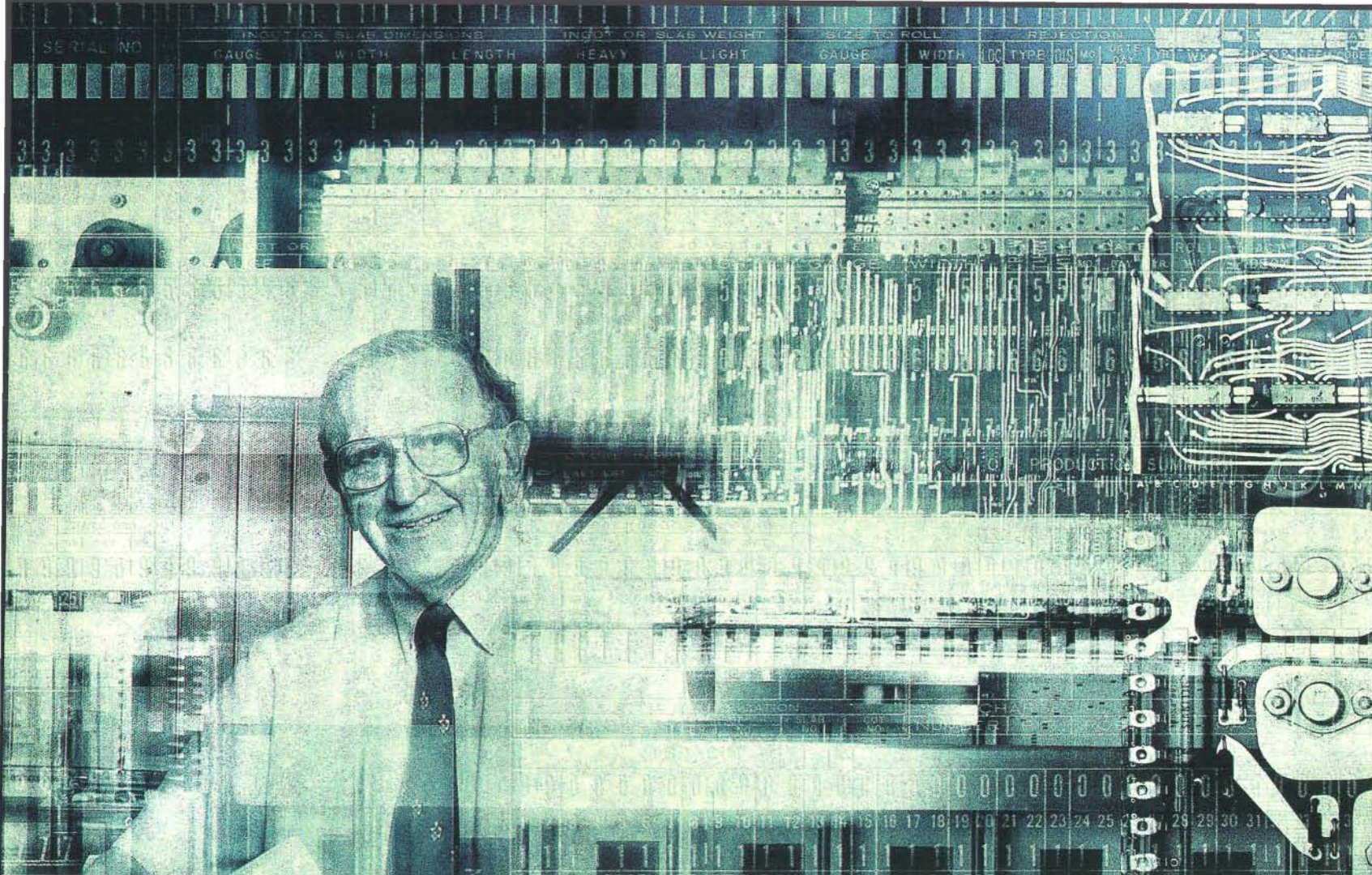
Well, the music industry says that's what MP3 is all about – stealing. Does it piss you off to see your music pirated?

To the pirates, I say the more the merrier. Success comes from the fans first – if someone is going to pirate something of mine, I just have to make sure to do nine or ten new things. I mean, you can't download me. ■ ■ ■

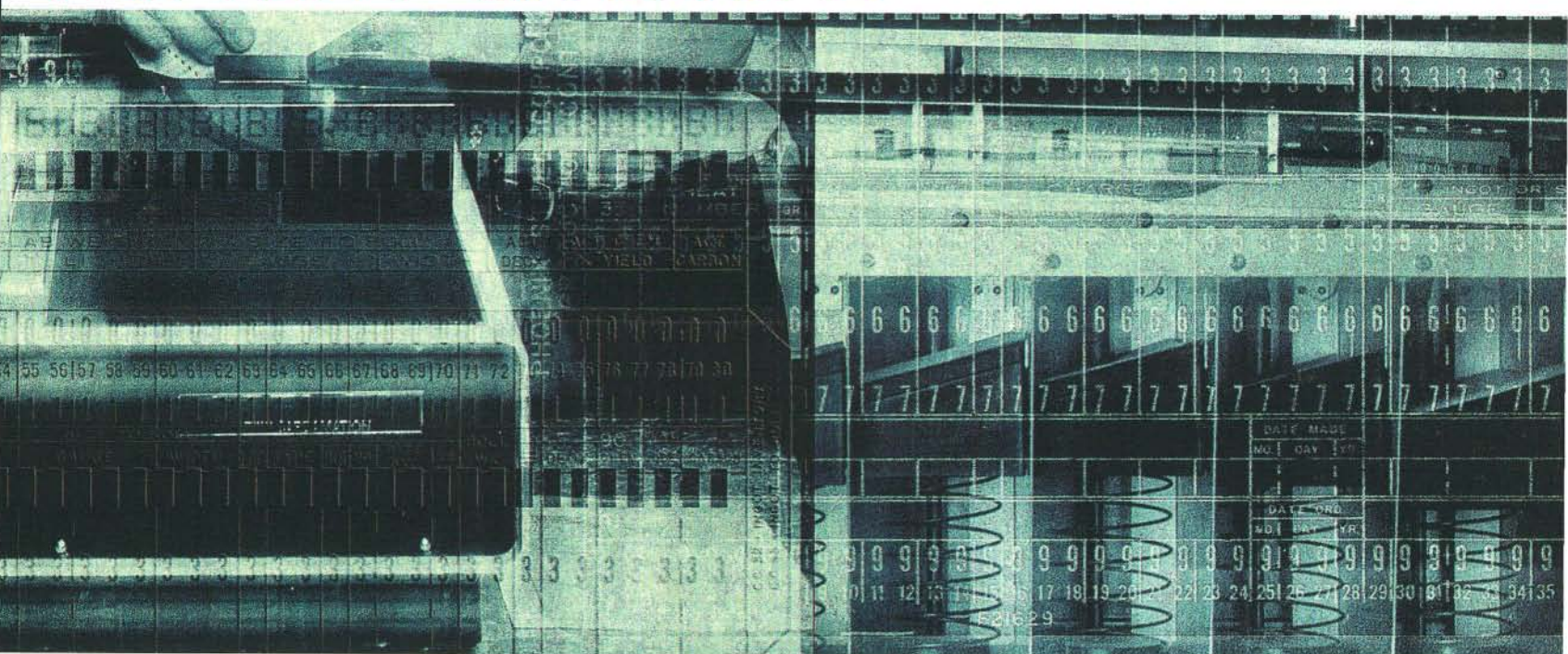
Chuck D may be sampling the mellow sounds of Stephen Stills, but politically the firebrand rapper is still louder than a bomb. Public Enemy's frontman pissed off his record label in late '98 by posting tracks from an unreleased album in MP3, a compressed audio format that squeezes entire CD-quality songs into Net-friendly packets. Surprise: Def Jam parent PolyGram demanded the songs be yanked from www.public-enemy.com and sent in the suits. The Recording Industry Association of America then announced that it was finally embracing digital distribution – in the form of an ultrasecure pay-to-play format that will compete against MP3. Too late, says Chuck D, who has promised to "ride the MP3 like a mutha-fuckin' cowboy." In January he slammed the industry's greed on a new cut called "Swindler's Lust" – released in MP4.

Associate editor Jesse Freund (freund@wired.com) wrote "Chip Hop" in Wired 5.09.

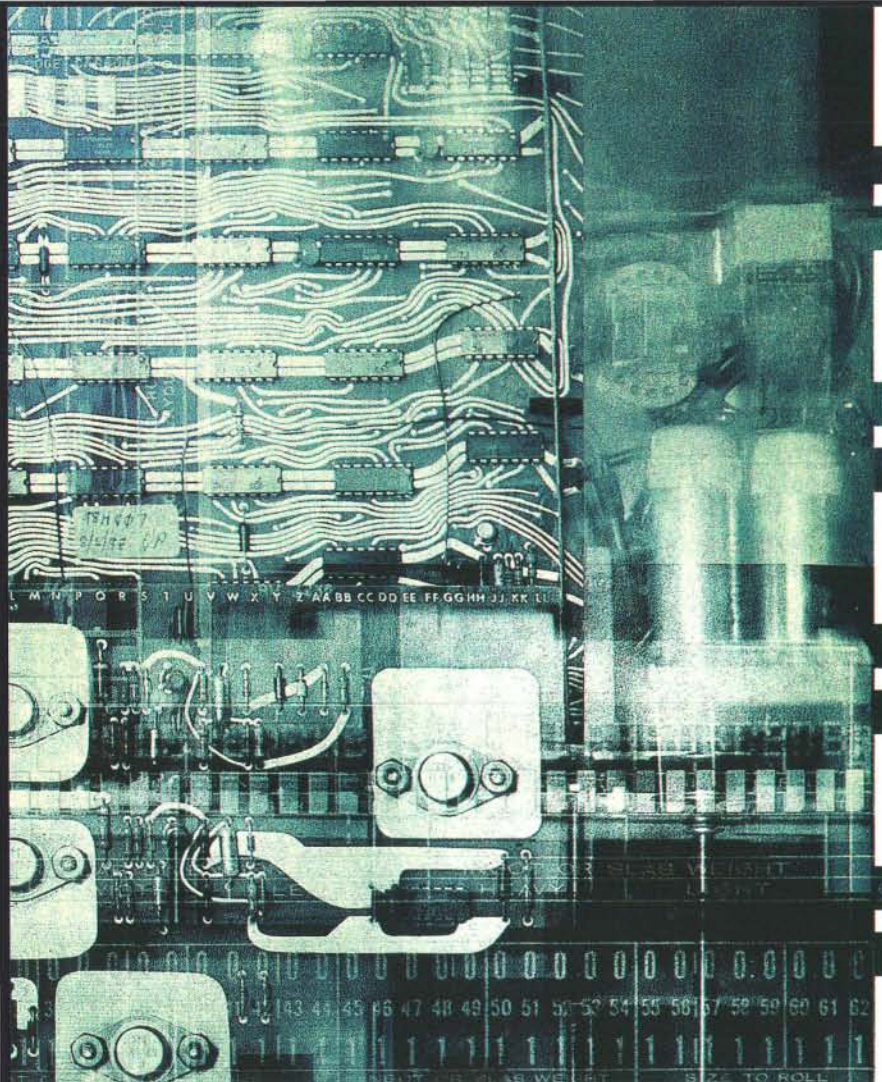
THE LITTLE SECRET THAT HAUNTS



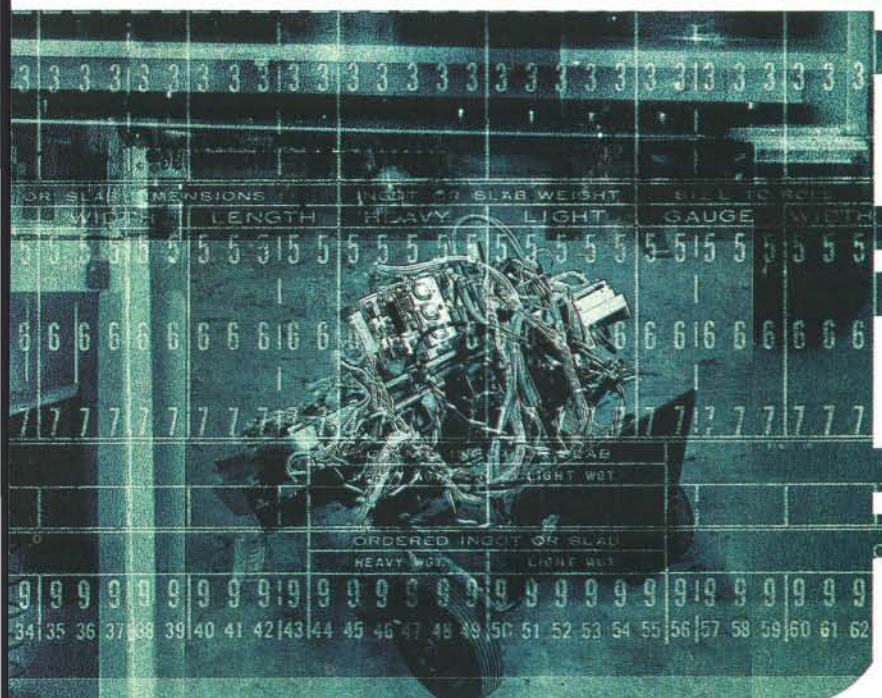
C O R P O R A T E A M E R I C A . . .



Cardamum founder Bob Swartz.



A TECHNOLOGY THAT WON'T GO AWAY



THE

BY GEORGE DYSON

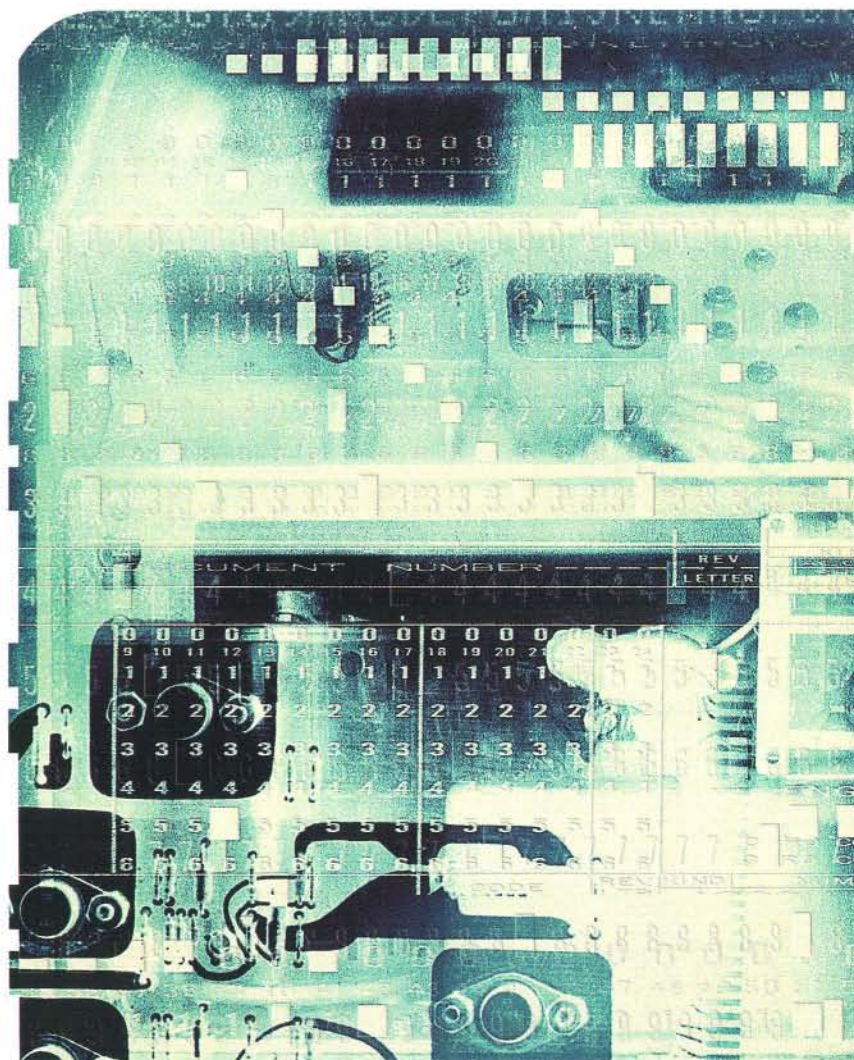
IMAGES BY SANJAY KOTHARI

On a recent Saturday morning, Bob Swartz, founder of Cardamation Company Inc., showed me around his warehouse, a huge space where a once-mighty techno-dinosaur still roams, happily swishing its tail. Based in Phoenixville, Pennsylvania, Cardamation is the last establishment in the digital universe that can sell you a full line of new, off-the-shelf machines for processing punch cards – those bit-storing relics from days gone by, when computers usually meant IBM, and the cards themselves were seen to symbolize eerie, antihumanist agendas. (“Do not fold, spindle, or mutilate” and all that.) We’re surrounded by piles of half-dismantled, half-assembled, strangely electromechanical stuff that looks more Victorian than Orwellian. In the age of desktop computing, we’ve been swept into a past where the machines are bigger than the desks.

Take, for instance, Swartz’s Cardamation RP82, a nifty, clunky gizmo that reads, punches, prints, and duplicates punch cards – and weighs about 350 pounds. It’s no museum piece, though. Swartz has sold several hundred of the line over the past 15 years, at prices ranging from \$12,000 to \$29,000.

“We’re having a boom in punched cards!” he exclaims, using the more formal terminology for punch cards favored by technical types. “As fast as the machines get built they disappear.”

These days, orders for punch-card processing equipment come in steadily to Cardamation, whose clients, mostly in the US, include a number of Fortune 500 outfits, among them the Ford Motor Company and several defense contractors. The mega-usages of yore – Social Security checks, income tax refunds – are history, but punch cards still cling to life. Though few companies rely on punch-card programming, many still maintain data – especially payrolls – on cards. Swartz’s company produces new



U N D E A D

card readers and punches, keeps old machines running, and builds interfaces that allow old and new readers to communicate with modern PCs. Indeed, anyone who has vital data cut into punch cards will sooner or later wind up talking to Bob Swartz.

Swartz, now in his 70s, has been involved with computers for 40 years. In the '60s, he worked for Sperry Univac, a pioneer computer maker, where he delivered punch-card systems to Western Union and other customers starting to use computers for networked communication rather than data-processing alone.

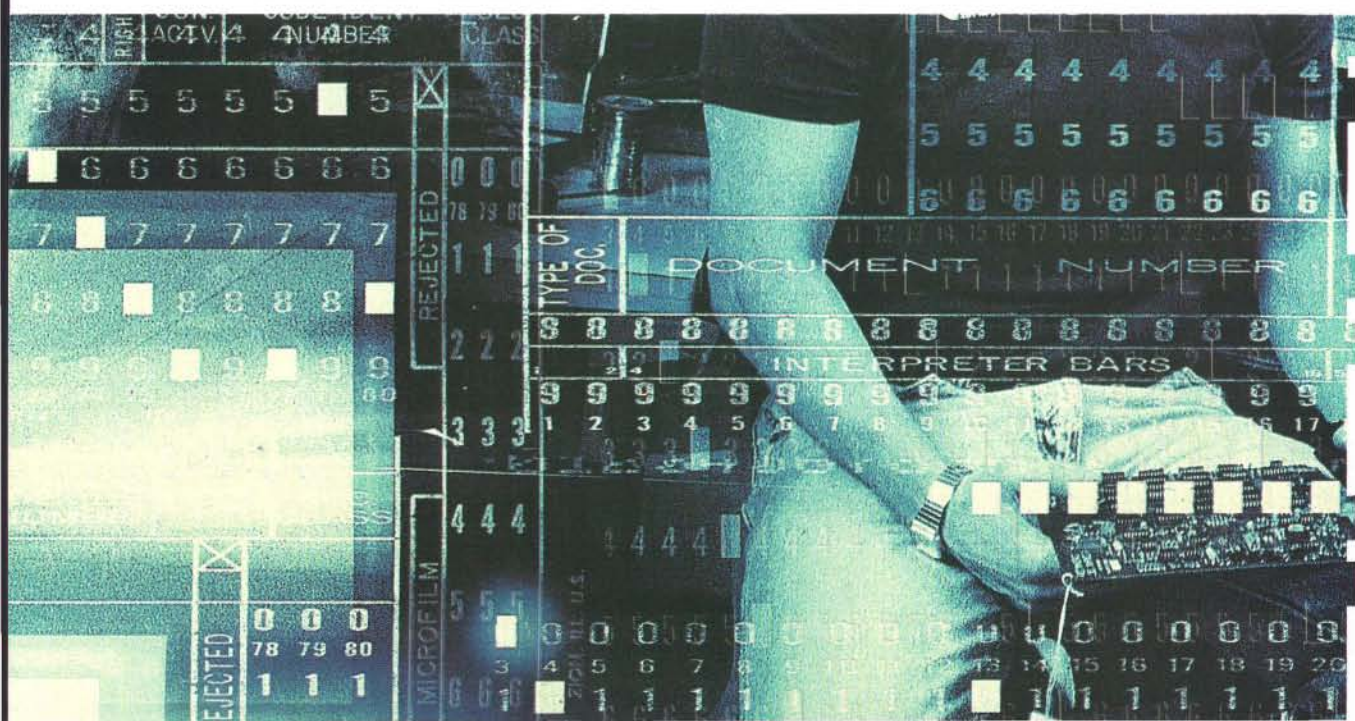
“These were large communication nodes, with two football fields of computers each,” he says, recalling that



James Alvord, the card whisperer.



COMPANIES AREN'T EAGER TO TALK



clerks on roller skates sometimes transferred strings of code, on punched paper tape, between incoming and outgoing lines.

After leaving Sperry in 1969, Swartz sold excess product lines for a company called Electronic Associates. "They wanted to go into new things, small computers," he says. The gear they ditched included a line of card punches and card readers that Swartz ended up buying. Cardamation, the company he founded in 1978, reached critical mass as other manufacturers – like Documation and Decision Data – abandoned the punch-card business. Swartz picked up the pieces.

For the most part, inertia is what keeps his company flush: Punch cards work just fine for many chores, so why upgrade? "The average person still using punch cards – and not panicking about it – will just sit thinking about the problem, philosophizing," says Swartz. "It's always next year, next quarter, they're going to get rid of them." But they usually don't.

"So," says Swartz with a smile, "they continue to need the equipment."



Punch cards were once the ultimate in high tech.

They were introduced in the middle of the 18th century, when Jacques de Vaucanson, a Frenchman, invented a card-controlled automatic loom. With his device, patterns coded once on a sequence of cards could be executed repeatedly in silk. Later, in the early 1800s, Joseph Marie Jacquard improved on the punch-card technology of the original device.

But it was the US Census Bureau that launched the business of punch-card information processing, providing the digital substrate upon which modern

Relays and switches were arranged into rudimentary logic gates, using the same architecture that now pervades silicon devices at the submicron scale. Hollerith established the Tabulating Machine Company in 1896. Consolidated into the Computing-Tabulating-Recording Company in 1911, the outfit was renamed International Business Machines in 1924. IBM subsequently developed industry-dominating punch-card machines that were rented, not sold – until in 1956 the company was forced, under antitrust legislation, to make such devices generally available.

US consumption of punch cards peaked sometime around 1967, at approximately 200 billion per year – roughly 400,000 tons of paper. IBM closed the last of nine in-house card-manufacturing plants in 1984. The market has dwindled ever since, but there are still an amazing number of cards in play. Tiffin, Ohio-based US Card Corporation dominates the remaining market, selling some 5 million punchies per month.

"They said that the punched card as we know it now would be completely obsolete by the year 1975," says Mike Daughenbaugh, who heads the company, "but here we are in 1999!"



Who's using them all? That requires a little digging, since most companies aren't especially eager to talk about their card dependency. (Swartz, wanting to protect customer privacy, isn't much help, though he does tell the story of how a "well-known" entertainment conglomerate – not a client of his – recently had trouble getting out a payroll because the card reader bonked.)

One proud customer is Melville Clark Jr., a retired MIT nuclear engineering professor and Manhattan

ABOUT THEIR PUNCH-CARD DEPENDENCY

Project veteran. Now 77, Clark runs the Institute for Scientific Research in Music, a scholarly group that studies the physics and reproduction of sound. Not long ago, he rented a CT600 reader from Cardamation to read a pile of cards that contain digital "samples" of the sounds made by orchestral instruments. Clark had produced the cards back in the '50s and early '60s for use in his studies of sound properties and wanted to transfer the data to modern DC-120 cassette tapes.

"The cards were stacked on their sides, from floor to ceiling, across one complete wall in my house," Clark says. "We knew the day of being able to read those cards was passing. We finally panicked." It took nine weeks to read them all. "Now I can put the whole wall of cards in my pocket, on tapes," says Clark.

Then as now, punch cards are simple-looking things, rectangular pieces of stiff paper with a matrix of data positions defined by columns and rows. Modern cards are 80 columns by 12 rows, a total of 960 bits.

Hollerith counted 62 million people with some 50 million punch cards, delivering the Census for \$5 million below forecasts. He also developed electromechanical methods for reading, sorting, and tabulating the results.

Punch cards helped make the complexity of large factories manageable; remnants of this historical symbiosis can be found at the Ford Motor Company. 170 ►

George Dyson is author of Darwin Among the Machines.

The Association for
Computing Machinery
PRESENTS



**Computers, Freedom
+ Privacy 1999**
THE GLOBAL INTERNET

OMNI SHOREHAM HOTEL
WASHINGTON, DC
APRIL 6-8, 1999

LOCAL → Access, Anonymity, Censorship,
Civil Society, Consumer Protection, Copyright,
Crime, Culture, Democracy, Diversity, Electronic
Commerce, Encryption, Free Expression, Freedom,
Governance, Human Rights, Legislation, Privacy,
Security, Standards, Surveillance → GLOBAL

S P E A K E R S partial list

Tim Berners-Lee
Director, World Wide Web
Consortium

Vinton Cerf
President, Internet Society

Adam Clayton Powell, III
Freedom Forum

Simon Davies
London School of Economics,
United Kingdom

Amitai Etzioni
Founder, Communitarian
Network

Deborah Hurley
Director, Harvard Information
Infrastructure Project

Joichi Ito
Digital Garage, Japan

Caroline Kennedy*
The Right to Privacy

Stephen Lau
Privacy Commissioner,
Hong Kong

Elliot Maxwell*
United States Department
of Commerce

Professor Arthur Miller
Harvard Law School

Jim Murray
Director, Bureau Européen des
Unions de Consommateurs,
Belgium

Aryeh Neier
President, Open Society Institute

Peter Neumann
Moderator, RISKS Digest

Andrew Niccol*
Director/Writer, *Gattaca*

Attorney General Janet Reno*
United States Department
of Justice

Barbara Simons
President, Association for
Computing Machinery

Nadine Strossen
President, American Civil
Liberties Union

George Vrandenburg
General Counsel, America Online

Peter Yip
President, China Internet
Corporation

Henrikas Yushkivaitshus
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France

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Cheap Power Tower

We've oft heard proclamations of the "cheap PC" coming our way. Well, it's finally a done deal: \$399 won't buy you happiness, but it will buy you a utilitarian PC (sans monitor) that you won't be ashamed to show off to your power-user friends.

This easy-to-set-up PC sports two USB ports, a peppy CD-ROM drive, adequate sound (with minispeakers), a 56K modem, and a respectable 32 megs of memory. Windows 98 and Microsoft



Meet the VW of PCs.

Works are already installed. Not too shabby, folks.

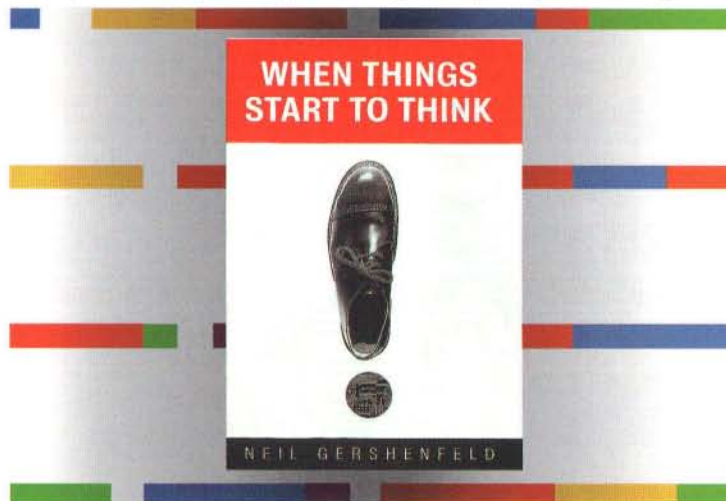
Let's face it: A used 486 will do the job for wordprocessing, emailing, number crunching, and such. But a 486 can choke from heavy Web surfing. This Pentium PC didn't crash or cry uncle — even while accessing graphics-intensive sites. OK, it's not the speediest (powered by a Cyrix 300-MHz chip), but that's to be expected considering the price. — *David Batterson*

eTower 300c: \$399. email: +1 (877) 566 3463.

The World as Interface

I ended my 1987 book *The Media Lab* with a question about whether Nicholas Negroponte and Jerry Wiesner's creation at MIT would become one of the great laboratories, like Los Alamos during World War II, Edwin Land's Polaroid, or early Xerox PARC. Now Neil Gershenfeld's *When Things Start to Think* gives thrilling evidence that MIT's Media Lab has indeed become one of the greats. And, in good Media Lab fashion, it blurts out all its best secrets.

Gershenfeld is an exceptional physicist and an able writer, so we can see the Lab's grand Things That Think project right from its core of inquiry: "The world is the next interface," he declares, and gets right down to the business of making smart and powerful versions of everyday items like pens, business cards, house keys, shoes, musical instruments, and money. In the postdesktop world, computer intelligence



... your shoes will collect business contacts.

and the Net go where the people are, via tools that cost pennies.

More than a fascinating look into what's coming, the book provides unusual insight into how to do great research. How do you organize effective research as high tech keeps accelerating, old hierarchies are displaced by more-productive heterarchies, and disciplines yield the best results through hybrid vigor? One answer is to fling corporate sponsors, scientists, and students into seething heaps and see what emerges. Better questions get asked faster, and a lot of just-in-time learning can converge on projects so bizarre and exciting that people go for days without sleep to put together a dazzling demo.

This book makes it clear that Gershenfeld and his researchers are having a great deal of fun. So will his readers. A world of Things That Think will be a bracing, exciting place. — *Stewart Brand*

When Things Start to Think, by Neil Gershenfeld: \$25. Henry Holt & Company: (888) 330 8477.

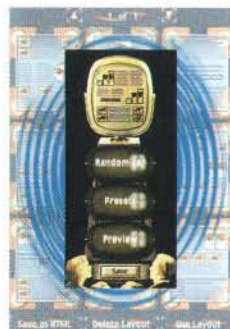




O Mighty Layout-o-Matik!

Layout-o-Matik promises to cure designer's block and start you on the path to exquisite Web page design. It's not meant for serious designers, but it has something the pro tools don't: entertainment value. It combines an ambient soundtrack with a sci-fi B-movie look and feel.

Place-holding graphics, bullets, buttons, link lists, tables, and text are included, with HTML generated painlessly in the background. If you're



Slices and dices HTML.

completely uninspired, the Randomizer function will choose a layout for you. Preferences let you kill the soundtrack and add meta tags, table borders, centering, and one of six background colors.

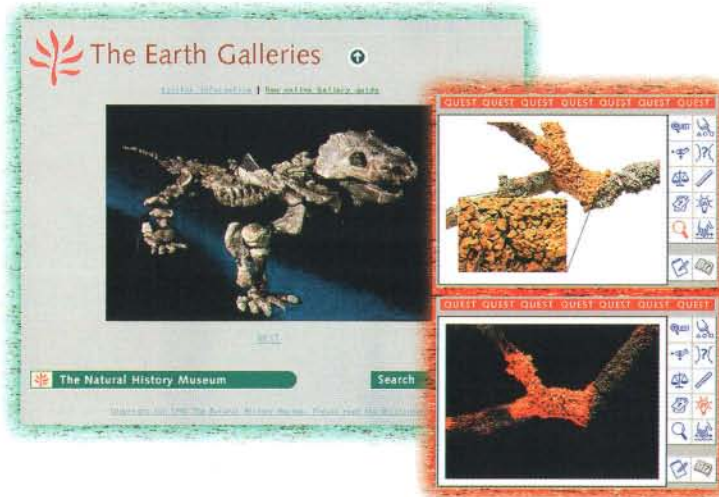
The beauty of this tool is that it lets you modify your work to suit the suits upstairs. Then just lay back and accept the kudos. No one has to know that mighty Layout-o-Matik is your ally. — *Alberto Gaitán*

Layout-o-Matik: \$10. Web-o-Tron: www.web-o-tron.com.

T1 Rex

No longer can natural history museums expect to pull crowds in with stuffed animals in glass cases. This generation demands something more hands-on, more interactive, and the Natural History Museum of London (a vast 19th-century building with over 68 million specimens) has responded, spending more than \$20 million on a set of multimedia galleries that tell the story of the birth of the universe. It's a humbling experience to peer billions of years into the past and learn about periods of mass extinction, which have wiped out more species than currently exist.

Can't make it to London? No problem. The museum's Web site is equally impressive. Created in July 1994, the site was the first of its kind among British museums. It's a simple affair that gets better as you delve deeper. One feature, Quest, lets you study a number of specimens from different angles — measuring, weighing, and subject-



Get up close and personal with these pre-media celebs. ing them to ultraviolet light.

I was lured to the scientific side of the site, where I checked out Las Cuevas Research Station in Belize, which studies natural and human impacts on the biological diversity of the Maya Forest. Science Casebook gives a less technical description of specific projects, like the hunt for traces of DNA preserved in prehistoric insects trapped in amber. But perhaps the most interesting feature is a list of Web links. Before long, I found myself browsing through images of dinosaurs provided by the Illinois State Geological Survey.

With so much mediocre information on the Web, this sort of guide to quality sites is becoming increasingly important. The Natural History Museum of London is an impressive global gateway to information about the natural world. — *Chris Lakeman Fraser*

Natural History Museum of London: www.nhm.ac.uk.

Take the Body!

Ever wonder why pro hockey has suddenly become such a hot entertainment ticket? It's a game of skill and finesse that also indulges the pugilist in everyone. More to the point, speed and violence are selling better than ever. Never mind fictions like RollerBall and the X-Games. Hockey is the real deal.

So it's hardly a surprise that gamemakers have been trying to capture hockey's elusive allure for decades. No one's done it better than EA Sports, whose original NHL breakout was widely regarded as one of the greatest sports sims of any kind. Judging from *Vice Squad NHL 99*, it's easy to understand why. This iteration is mind-bogglingly sophisticated, seamlessly meshing gameplay with tons of full-motion video, real-time replays, color commentary, elaborate lighting effects, and real advertising. It's high realism: The players are liable to drop their gloves and go toe-to-toe at the slightest provocation.



So real, you'll wake up with bruises.

Needless to say, there's a fine line between virtue and vice. The trouble with the game may be that it simulates modern hockey *too* well. Like others of its kind, *NHL 99* is as much a media simulation as a sports simulation. In other words, EA wants the game to look as much like televised hockey as possible. Which is kind of odd, when you think about it. Why not be satisfied with the game itself? Instead, there's a barrage of broadcast-style features that mimic both the best and the worst aspects of modern ice hockey on TV. A paralyzing choice of eight "camera angles" is complemented by an authentic stream of twaddle from commentators steeped in hockeyspeak, not to mention positively barbaric live-action footage and a deafening heavy-metal soundtrack. "If it's in the game, it's in the game," boasts EA Sports. That seems to be both a promise and a threat. — *Hans Eisenbeis*

Vice Squad NHL 99: \$49.95. EA Sports: +1 (650) 513 7555, www.easports.com.



Don't Leave Home Without It

No one has to know you're *horny@hotmail.com*, or even that you're out of the country. And you don't have to plead with your email provider for a local dialup number in French Guiana or wherever your sense of adventure has landed you.

That's because there's something even better than free email these days: free Web-based access to your regular email account. At MailStart.com you can key in your standard POP3 email address and password, and the site's engine will pump your mail into the browser window. Best of all, the whole thing is completely transparent to your fellow correspondents because your regular address appears in the sender window. So you don't have to mess with confusing, temporary e-addresses –



Mail when you want it, where you want it.

"Starting Tuesday I'll be *frazzled@yahoo.com*" – or set that autoresponder to say, "Away from my mail." When you get home, all of your mail – including the stuff you've read and responded to – is still on the server and appears in your email client, unless you tell MailStart to delete it.

Both Yahoo! and Hotmail now offer access to POP3 accounts, too, but your messages are stamped with your Hotmail or Yahoo! address, taking the transparency right out of the deal. Of course, none of the POP3 access services work if your email is firewall protected or running over a proprietary system like AOL or MSN. But if you've got a local ISP or a provider like Netcom or EarthLink, you can start traveling light. – *Kaitlin Quistgaard*

MailStart: free. Brandmakers: www.mailstart.com.

Page After Page

The best part about two-way paging has always been the ability to send pages during busy meetings. "Will arrive 15m – Beth," my wife pages me. "Busy. Come in 30," I respond.

The worst part about two-way paging has always been the units themselves – behemoths the size of an overstuffed wallet, with batteries that last two weeks or less. How can you covertly send a message when everybody is trying to catch a glimpse of that overgrown piece of electronics in your hand? Rather than carry around one of these monstrosities, many people I know have stuck with their one-way alphanumeric.

Thankfully, Glenayre's new AccessLink II pager doesn't look like a two-way pager. In fact, this unit is actually smaller than my one-way. But it's a full-functioning two-way communications device that can send pages, email, and even faxes in metropolitan areas throughout the United States. Battery life is also boosted – to more than 30 days on a single AA.



Talk business without all the eavesdropping.

AccessLink II has an easy-to-use interface that lets you view incoming pages, forward them to friends, or file them away in folders, and its infrared interface lets you send pages or program your address book from a PalmPilot.

What this pager doesn't have is one of those tiny (and useless) QWERTY keyboards. Instead, you compose messages one letter at a time by picking the characters from an onscreen display. It takes some getting used to, but after a few days you can send messages quite quickly.

Service provider SkyTel's two-way paging has other advantages: guaranteed message delivery and nationwide alphanumeric coverage for \$24.95 per month. My only complaint about the AccessLink II is the belt holster, which scratches up the bottom of the pager's four-line screen. Despite this flaw, it's still a huge win. – *Simson Garfinkel*

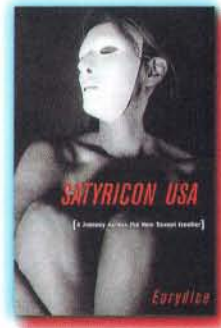
AccessLink II: \$195. Glenayre: www.glenayre.com. SkyTel nationwide two-way coverage: starts at \$24.95 per month. SkyTel: www.skytel.com.

Millennial Checkup

The jury's still out on when the 20th century ends.

2000? 2001? Some say it happened the day Sinatra died. But author Eurydice finds its ending in a mood of discovery. At once a voyeur, skeptic, and seeker, she reports on the national passion for those hardy American perennials – sex and personal growth – with intelligence and humor.

In *Satyricon USA*, Eurydice travels to 10 cities and creates a disturbing, edgy, erudite portrait of the nation's sexual mores at century's end. Eurydice takes a "rite-of-passage



Love: American style.

road trip through America," interviewing housewives, students, bankers, and transvestites. She unearths a sexual America profoundly inventive, sadly repressed, but more normal than she envisioned. From observance of bloodletting rites in San Francisco to her encounter with a cyberlover in Memphis, she hears the thrum of passion in a range of shattering, surprising ways. – *Michael E. Ross*

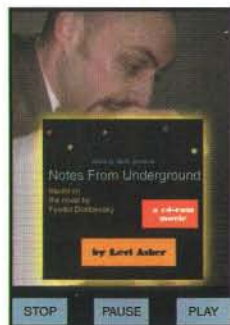
Satyricon USA: A Journey Across the New Sexual Frontier, by Eurydice: \$22. Scribner: +1 (212) 698 7000.



Cinema Underground

Conventional filmmaking is morally bankrupt. Even the indie scene is money crazed these days," says Levi Asher about why he created *Notes From Underground*, his movie adaptation of Fyodor Dostoevsky's angst-lit classic. While Hollywood makes expensive but mediocre films, Asher shot his movie with a camcorder – and published it on CD-ROM.

There's nothing much new about the technology; Apple's QuickTime, the file format used on the CD-ROM, has been around for years. In



Hollywood, take note.

retrospect, the idea seems obvious – but it's Asher who made it, with a soundtrack by the Leningrad State Orchestra and a minimal cast.

The film traces the Underground Man's journey through New York. As I watched a snowy Manhattan scene on my computer, music playing in the background, I felt like I was witnessing a first – like seeing an early silent film at the turn of the century. – *Michael Stutz*

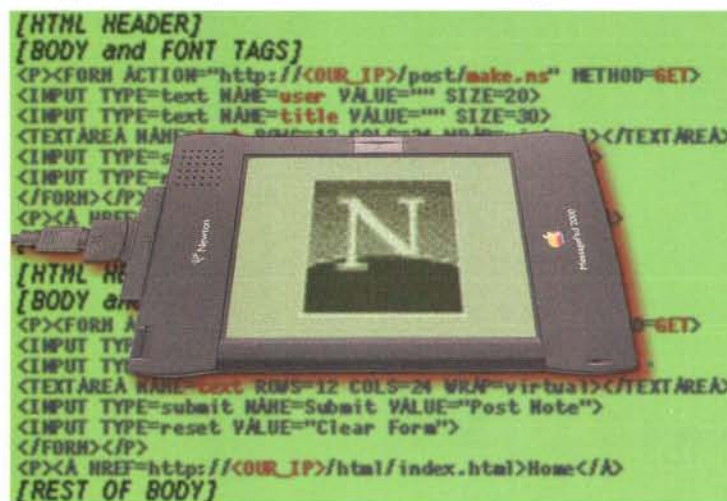
Notes From Underground: \$12. Asher: www.litkicks.com.

Pocket Server

I'm sitting in Tilden Park, in the hills east of Berkeley, running a Web server. No big deal – except there's no phone line here and the only computer around is my handheld PDA, an Apple MessagePad 2100. So what if I look like a work-obsessed geek? I'm running what may be the smallest Web server around. Combined with a wireless modem, it's certainly the most portable.

Some seriously dedicated Newton fans have developed a scaled-down HTTP server that allows me to get on the Net in under five minutes. Once online, I can serve up HTML pages with images, create and host bulletin-board discussion groups, and share my personal calendar (where you'd see I had plans to visit Tilden). Future versions will let me post my contact database and create GIF images, too.

The simplicity of this Web server – known as NewtonOS Personal Data Sharing – is remarkable. Two small apps and less than a dozen settings make it easy to install. Click a button and you're online.



The Newton is dead. Long live the Newton Web server.

There are downsides to serving Web pages from a Newton, however. In my mind, the P in PDA stands for portable, and even the best wireless modems can't keep a connection while you're on the subway. You also have to disconnect your server when you take your Newton to new locations. I generally use mine on the Ethernet network at the office and shut it down when I take my MessagePad to a meeting.

As you might imagine, despite the 162-MHz StrongARM processor, the server is a little bit slow. More than a few people hitting it at once can be a problem. Still, it's amazed my Pilot-owning friends and demonstrates the power of Apple's dead product.

While it won't replace your Sparc20, the Newton Web server is simply an amazing feat. – *Richard Dean*

NewtonOS Personal Data Sharing: free. Newton Personal Data Server: come.to/lightyear_media.

The Games Girls Play

There's been a hubbub about the dearth of girls' computer games, but not much headway bringing them successfully to market – *Barbie Fashion Designer* notwithstanding. Meantime, games for boys – i.e., all games – continue to proliferate. *From Barbie to Mortal Kombat* attempts to address this discrepancy with a cacophony of theoretical essays, interviews with industry professionals, and editorials by prominent female gamers.

Much of the theoretical material questions and backs up current assumptions with research on how girls interact with computers, how they play, and which features they're drawn to – including, not surprisingly, nonlinear and nonviolent adventures, fashion, relationships, spaces of one's own, nurturance, and fuzzy animals.

But the meat of the book is found in interviews with girl-game pioneers such as Brenda Laurel and Heather Kelley, as well as with mainstreamers Nancie Martin of Mattel and Lee McEnany Caraher of Sega. Here you get an idea about various developers' approaches to synthesizing the research



Thinking outside the pink box.

and breathing it into actual products. The end sometimes justifies the means: If a pink box sucks a girl into a game, so be it.

From the feminist camp, Suzanne De Castell and Mary Bryson wonder whether catering to such culturally sanctioned desires is "producing tools for girls" or "producing girls themselves." Outspoken gamers like Nikki Douglas of Grrl-Gamer and Aurora of GameGrrlz take the vanguard to task, insisting it's more valuable – and fun – to shoot boys on their own turf.

It's an unrelenting din, but this handful of women thinking seriously about gender and gaming agree on at least one thing: Girls need access to technology early on, something boys already take for granted. Though the book fails to forge a singular idea of how girls' relationships to computer games should look, the forces are gathering. – *Karen Eng*

From Barbie to Mortal Kombat: Gender and Computer Games, edited by Justine Cassell and Henry Jenkins: \$35. MIT Press: (800) 356 0343, mitpress.mit.edu.

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*Bandwidth based on graphics to main memory. **I/O bandwidth as compared to 32-bit PCI. †For information on the 1999 availability of the Silicon Graphics 540 workstation, please call 1 888 SGI-6717. ‡Requires additional software under Windows NT 4.0. Prices quoted are for U.S. only.
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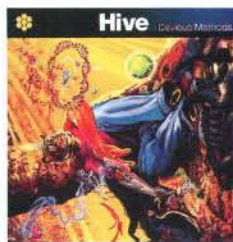


Music

HIVE

Devious Methods (FFRR)

Proving there might yet be hope for American breakbeat culture, Hive pieces together crisp frantic percussion, menacing keyboards, thrashing guitars, and conspiracy-theory vocal snippets. Most potent as a junglist, Hive shines brightest with the rattle and drum of "Weapons of Mass Destruction" and the ominous descending bass patterns of "One Way Path." — *Jon Caramanica*



MILES DAVIS

The Complete Bitches Brew Sessions

(Columbia/Legacy)

Carlos Santana once said that hearing *Bitches Brew* for the first time was like growing up in a grass hut, stepping outside one day, and seeing a sliding glass door on a skyscraper. Though Davis's 1970 double album wasn't the first to mix rock instrumentation, funk grooves, and the jazz "cry," the electrified swamp of *Bitches Brew* still bristles the hairs on the back of your neck with its primordial terrifying majesty.

A revelation, this four-CD set unearths 90 minutes of unreleased jams. While the original album emphasized urban ferocity, the discoveries here take the meditative serenity of Davis's *In a Silent Way* a light-year deeper into Indian-inflected space. — *Steve Silberman*



RACHMANINOFF

A Window in Time: Rachmaninoff Performs His Solo Piano Works (Telarc)

Though he's been dead 56 years, Russian pianist Sergei Rachmaninoff's new CD teems with life. Inventor Wayne Stahnke's electronic reproducing piano reanimates 19 of Rachmaninoff's pieces and reestablishes his principal status. Culling from antiquated piano-roll recordings made throughout Rachmaninoff's career, Stahnke processed and translated his data to include pedaling, phrasing, and other subtleties.

The pianist's well-known arrangement of Rimsky-Korsakov's "Flight of the Bumblebee" (1929) proves Rachmaninoff was as nimble as he was powerful. — *Colin Berry*



HANK DOGS

Bareback (Hannibal)

Some records demand a nighttime intimacy — curtains closed, the sense of darkness outside — to open up. That's the way of the Hank Dogs. The vocals and music (acoustic and folksy) seduce softly, but the words belie the mood, revealing a dangerous edge. Nick Drake mastered this quality, and these are his natural heirs. They draw you in with a velvet glove; it's only too late that you realize it's holding a sharp sword. — *Chris Nickson*



THE OLIVIA TREMOR CONTROL

Black Foliage (Flydaddy)

Athens-based Olivia Tremor Control's sophomore release is a psychedelic pop record subverted by noise artists. The Olivias wire warm multipart harmonies, comfy late-'60s guitar, and piano melodies with sweet chimes, mournful handsaws, and absurd kazooos. Each song explodes into shards that, as they sing, "liberate the world of sound." But with the CD clocking in at 69 minutes, the Olivias could benefit from a good editor. — *Jeff Stark*



CO-FUSION

Co-Fu (Sublime)

Tokyo-based Co-Fusion, who signed with Japanese techno maestro Ken Ishii's Sublime label, immediately became stars in their native land. The band's debut is driven by complex percussion programming, obviously learned through hard study of British drum-and-bass records. But instead of copying older styles, Co-Fusion has taken that complexity and, er, co-fused it with elements of techno and jazz. The result twists and turns between genres, sounding one minute like 4Hero in a sound clash with Jeff Mills, the next as if Art Blakey and Kraftwerk had stumbled into the same studio. With such variety, not everyone will like each track, but the whole is stunning. — *Hari Kunzru*



ANI DIFRANCO

Up Up Up Up Up Up (Righteous Babe)

Twelve months after the release of *Little Plastic Castle*, the prolific punk-folk indie queen lets loose the most accessible of her dozen solo albums, while holding onto her visceral sound. Ranging from goofball to righteous babe, DiFranco is in classic form here: Songs career from hushed acoustic poetry to finger-bleeding guitar attacks and vocal flights.

Evidence of her recent marriage appears mostly through omission. Her pissed-off sexual politics have dimmed. (There is a song about a former female lover.) Now her smart-as-a-whip edge attacks social politics. Indeed, it's her personal growth that's most riveting. Her spirit is summed up on the raucous closing jam, on which she riffs, tongue firmly in cheek, "I will not be afraid to let my talents shine." — *Beth Johnson*



FUNKY GREEN DOGS

Star (Twisted America)

Oscar Gaetan and Ralph Falcon's Murk label patented a fiery signature sound in the '90s. Their raw, tribal drums and from-the-gut vocal harmonies are sentimental favorites with many veteran house DJs and dancers.

The pair has spent the last few years working under the Funky Green Dogs moniker, adding vocalist Tamara on this full-length effort. *Star* unabashedly shoots for the widest possible audience, but that's a good thing — secrets like the Murk boys shouldn't be kept forever. — *Tamara Palmer*

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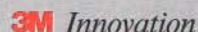


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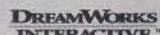
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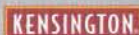
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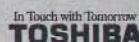
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JUST OUTTA BETA

Dwarf Drive

At first you'll fixate on the tiny proportions of IBM's Microdrive. With a mechanism similar to the disk drive inside your computer, this dollhouse version has a metal arm that swings across a lilliputian magnetic plate.

Sure, the concept of a 1-inch, 340-Mbyte disk drive is impressive, but the capabilities are what matter. Canon's PowerShot Pro70 digital camera, one of the first applications of the



Pint-size power.

IBM tech, dares photographers to shoot high-resolution digital pics all day without running out of storage space. Traditional flash-memory cards get very expensive as you move up in capacity. The Microdrive, on the other hand, promises to cost less. And since its tiny plate spins at 4,500 rpm, it can access data much faster.

—Bob Parks

Release: March. Canon: www.canon.com.

Studio in a Box – Really

Digital videocameras have all the hallmarks of a great gadget – they're small, they're shiny, and they shoot beautiful footage. But editing footage on a home PC – the advantage I've heard every DV camcorder maker tout – has been accompanied by much knocking on wood. Until now.

STB's DesktopVCR, a \$300 videoboard, converts digital video into MPEG2 format, the standard used for ultraclear DVD movies and satellite TV. Now you can make a video of your dog's backyard antics, connect your camcorder to your firewire port, and – voilà! – the board compresses the footage into MPEG2. From there, you can edit the movie with the bundled Asymetrix Digital Video Producer software, applying scene transitions such as wipes, fades, and other effects. And if you



Scene stealer for PCs.

have a DVD burner, you can even make a hard copy of *Fido's Greatest Tricks*. Home movies made this way will work in any DVD player.

The product name refers to the device's onboard television tuner, which saves favorite TV shows on a hard drive. But to me, the board's most compelling feature is its power to convert multiple formats into a digital lingua franca. During the next few months, several boards will hit the market, all powered by the same new C-Cube chip that drives the DesktopVCR. Later products will even include a firewire port mounted on the board. But STB's package looks like a promising first entry and will likely continue to be the least expensive MPEG2 card available. —Bob Parks

Release: spring. STB: www.stb.com.

All Ads, All the Time

TV commercials are made in a frenzy of quick deals with impossible deadlines.

"Your creative director might hear of a new spot, and suddenly he wants to figure out how to get a tape, who did the work, and how to start bidding for the director," says Pomegranite's Jan Frei.

To keep up with plugged-in pitch pros, *Advertising Age* and Intel have devised a satellite newsfeed called the Ad Age Edge. Using a dedicated PC terminal, the service delivers late-breaking industry reports and flawless full-motion video



Insider's edge.

of the latest TV ads.

Currently, agencies pay clipping services hundreds of dollars in search-and-dub fees for VHS copies of ads. The new service, with a yearly price tag starting at \$17,500, will keep an inventory of spots for 30 days, as well as commentary from the magazine's editors and background on the ad's creation. Like Bloomberg's service, the Ad Age Edge is a pricey status symbol that offers highly refined data to executives. —Bob Parks

Release: March. Ad Age Group: www.adage.com.

README

ON THE BOOKSHELVES OF THE DIGERATI

CARL ROSENDAHL

CEO, Pacific Data Images.

Irons in the Fire, by John McPhee. "I heard someone reading McPhee's stuff on public radio many years ago and just loved his style. He's a combination engineer/scientist/humanitarian, so you get to learn about aspects of the world that you may never have known. I love the piece called 'The Gravel Page,' which is about forensic geology. I have very little interest in geology, but that's what I really like about his writing: It's a study through the eyes of the people who are doing it."



JILL ARNOLD

Founder and CEO, ePlay.

Creativity: Flow and the Psychology of Discovery and Invention, by Mihaly Csikszentmihalyi. "I'm interested in how people and companies can be creative. There are a couple of ways to look at creativity. There's the big C – like the theory of relativity. It's an invention or idea that fundamentally changes a domain. But this book looks at the small c – what keeps us all ticking. If you have a broad range of experiences, then you can become smarter both cognitively and emotionally."

HOWARD TULLMAN

CEO, JamTV.

Net Gain: Expanding Markets Through Virtual Communities, by John Hagel and Arthur G. Armstrong. "I read just about everything that's out there about JamTV's various businesses. This book is about virtual communities. I think the market's ultimately going to be all about the consumer's power. The biggest thing the Internet represents is that if you don't want to participate in someone else's marketing scheme, you can get out."



SHIGERU MIYAMOTO

Game designer, Nintendo.

The Education of Little Tree, by Forrest Carter.

"When it comes to the frequency of English books being translated into Japanese, I don't think it's so many. There are some exceptions, like the Harlequin romance stories. But I read the Japanese translation of this book and found it very interesting. In this story an old man is teaching his grandson about Native American culture and traditions. And the child has learned to live with these things in conjunction with nature."

—Julie Sullivan



*Jeremy, Shanti
and Mark are
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and IPX. We gave
their interfaces IP
addresses and IPX
addresses, and
gave our routers
specific names. We
created a web page
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HTML tags."*

— Shanti, age 18

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Find Your Type

Entering a virtual room aglow in blue light, I'm intrigued by letters and signs that float like hidden messages on the walls. Exploring the space, I accidentally hit one of the many colored bars: A message set in Blackmail type appears on a red background: "The myth of the obvious!" The message moves; it's animated. Now I'm curious. I discover almost endless phrases, visually translated and interpreted with music and animation. Each message is set in a different type in Face2Face's playground of fonts, *Der Typografische Spielfilm*



Font factory.

(The Typographical Movie).

Face2Face, a German font distributor known for its themed packaging, has put out a nine-font CD that comes in a genuine film box and canister. Besides visiting the virtual font showroom, you can review F2F's whole catalog of fonts electronically or on a 12-meter foldout, display the entire alphabet, or check out animation designed with their typefaces. The movie is an inspiring journey to the world of typography.

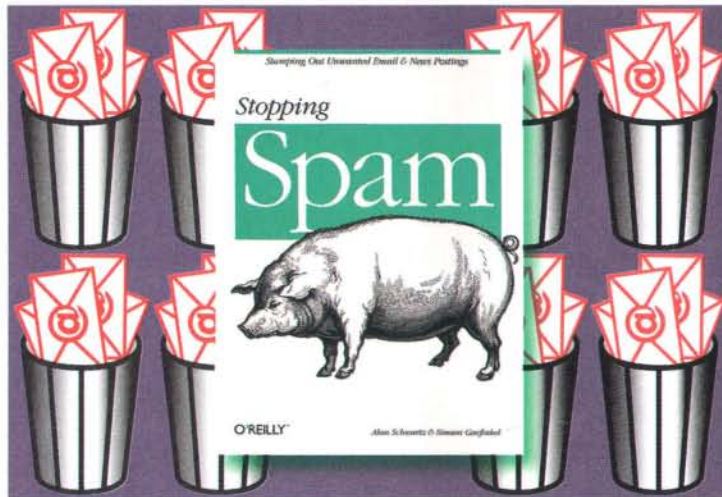
—Katja Grubitzsch

Der Typografische Spielfilm: DM148 (\$93). Face2Face: www.xplicit.de/f2f.

You've Got Junk Mail

The late Jon Postel realized back in 1975 that the Internet was vulnerable to what he called the "junk mail problem." In a moment of extreme understatement, Postel wrote, "It would be useful for a host to be able to decline messages from sources it believes are misbehaving or are simply annoying." Twenty-four years later, it seems impossible to go a day without misbehaving, annoying spam.

Fortunately, Alan Schwartz and frequent *Wired* contributor Simson Garfinkel have assembled a comprehensive guidebook for avoiding Internet spam. *Stopping Spam* examines the cops-and-robbers tactics of both spammers and spam fighters at several levels, from the technical to the political. Its surprisingly engaging chapters leap from arcane Unix-configuration files to consumer email filters to lobbying organizations for the truly outraged.



Every AOLers dream come true.

The first 40 pages recount the history of spam, with excerpts and quotes from Postel and others. The authors even include bits from spammers Marcia Canter and Lawrence Siegel, as well as reformed "Spam King" Sanford Wallace, letting the offenders give their side of the story in their own words. Readers not infuriated by the go-for-it advice Wallace and crew dispense will find them hysterical. In the end, it seems that spammers spam because they can.

After three years of get-rich-quick books on how to send spam, a definitive work on its deterrence is long overdue. So much so that while I napped on a shuttle flight from Silicon Valley to Redmond, my copy of *Stopping Spam* disappeared from the seat next to me.

—Paul Boutin

Stopping Spam: Stamping Out Unwanted Email & News Postings, by Alan Schwartz and Simson Garfinkel: \$19.95. O'Reilly & Associates: +1 (707) 829 0515.

Contributors

David Batterson (davidbat@yahoo.com) has been online since '85 and was once a BBS sysop.

Colin Berry (colinb@sirius.com) pens short stories and covers the arts, music, and culture from San Francisco. He is writing a book on Internet addiction.

Paul Boutin is a manager at HotBot. He is still wondering how technology will survive on only 17,576 three-letter acronyms.

Stewart Brand is cofounder of the Well, the Hackers' Conference, and the Global Business Network. His 1987 book *The Media Lab* is still in print.

Jon Caramanica (jon@tracemag.com) is *Trace* magazine's editor at large.

Richard Dean (rdean@organic.com) founded NPR Online and is a commentator for National Public Radio's *Weekend Edition-Sunday*. His real job is developing Internet strategies at Organic Online.

Hans Eisenbeis lives in Minneapolis, where he edits *Request Line* (www.requestline.com).

Karen Eng (aerodeliria@hotmail.com) contributes to *Ben Is Dead*, *RiotGrrl*, *PC Games*, and other magazines.

Chris Lakeman Fraser is a journalist, lecturer, film editor, and director.

Alberto Gaitán is an artist/programmer in the DC metro area. He's tired of Headgate and longs for the day when DC will revert to boring ol' Oz.

Simson Garfinkel writes about computer security and usability. In his spare time he runs an ISP on Martha's Vineyard.

Beth Johnson is a senior reporter at *Entertainment Weekly*.

Hari Kunzru (hari@dircon.co.uk) is a London-based writer.

Chris Nickson (cnicks@seanet.com) was born in England and now lives in Seattle.

Tamara Palmer (trance@netcom.com) is coeditor of *URB* and currently transmits to Amazon.com, CDnow, and *Flaunt* from the depths of San Francisco's west side.

Kaitlin Quistgaard (kquix@earthlink.net) has done the writerly thing for *Wired*, *Time*, the *Sunday Times* of London, and more.

Michael E. Ross (rossculcha@aol.com) reviews books and music for *Vibe*, *Salon*, and *Newsday*, and is building a novel while living in Brooklyn.

Steve Silberman is senior culture writer for *Wired News*.

Jeff Stark is a freelance writer in San Francisco.

Michael Stutz (stutz@dsl.org) is a writer. The text of his first novel, *Sunclipse*, has been released as freeware.

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Business Class:

3D/Zone 2

The synthetic 3D/Zone 2 keeps you warm at 15 degrees (that beats your average three-season bag). It's a hip "twilight" blue number with a "French blue" trim, and the end is shaped like a trapezoid to make extra room for your feet.

3D/Zone 2: \$190. Moonstone: (800) 390 3312, www.moonstone.com.

Coach:

Base Camp Bag

If you plan to battle the bugs only once in a while, this 20-degree bag is for you, soldier. It's got Polar-guard synthetic filling and a nylon taffeta lining and shell, and it's small enough to toss into your backpack. And because it's an L. L. Bean, you get the warranty and great customer service.

Base Camp Bag: \$80. L. L. Bean: www.llbean.com.

Car CD Players

First Class:

MB-75

When it comes to auto CD decks, you'll get the most thump for your trunk from this six-disc Nakamichi player. The MB-75 has a 40-watt amp, handheld remote, and 30-station-preset tuner, plus a patented suspension system that manages even the bumpiest of roads. And unlike most car players, it handles CDs only by their outside edges and ejects them slowly so you can handle them right, too.

Nakamichi MB-75: \$699. Nakamichi: +1 (310) 538 8150, www.nakamichi.com.

Business Class:

CDA-7837

With all the info displayed on this single-disc CD player's LED – elapsed time, programmable disc titles, single-band AM and FM presets – it might be hard to keep your eyes on the road. Luckily there's a remote control to keep close to the steering wheel. Gimmicks aside, the 40-watt player has awe-inspiring sound – as well as a detachable faceplate and easy hookup with CD changers and equalizers.

Alpine CDA-7837: \$340. Alpine: www.alpine1.com.

Coach:

DEH-245

If you just want to replace your factory-installed radio with a decent CD player, go with this Pioneer. It has great sound and basics like separate bass and treble, and it sports both Automatic Gain Control and a silicon-dampened chassis to keep the music playing smoothly over potholes. Though you can't add a changer, this 35-watt number is a perfect entry-level spinner.

Pioneer DEH-245: \$230. Pioneer: (800) 421 1404, www.pioneerelectronics.com.



Portable TVs

First Class:

EV-600

Flick open this compact Casio and enjoy crystal-clear images on the 3-inch active-matrix TFT. With the superb sound, adjustable color, and external antenna jack for optimal reception, you'll be glued to this set.

Casio EV-600: \$249.95. Casio: (800) 962 2746, www.casio.com.

Business Class:

RD0525C

At about 4 pounds, this Philips is bulkier than its comrades, but it has great features, like audio and video inputs and a power jack for your car's cigarette lighter. Sound and reception are good, but the clincher is a 5-inch, dark-glass picture – big enough for crowding around in the SUV or family boat.

Philips RD0525C: \$199. Philips: (800) 531 0039.

Coach:

L1800BC

Just slightly bigger than your average TV remote, this RCA is the perfect low-budget addition to tailgate parties or emergency kits. It offers features you'd expect from a higher-priced mini, including an active-matrix display and an external-antenna option. True, its 1.8-inch screen is smaller than some postage stamps, but clarity and reception are excellent, even indoors.

RCA L1800BC: \$129. RCA: +1 (317) 587 4450, www.rca.com.





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NEW MONEY More is better.

Anatomy of an IPO

Wall Street Wins, You Lose

If you believed the hype, theglobe.com's public offering was the hottest of all time: a 606 percent rise the first day suggested that traders made some serious loot. But what Wall Street *wasn't* saying was that anyone who bought TGLO that day got killed. The real money went to the old money.

As late as last October, the fundamentals of theglobe.com – a second-rate

Internet community – looked so weak that its offering price was sliced by 25 percent. Even at that price, however, the deal was too ugly for the Street, and it was dropped. But lead underwriters Bear Stearns and Volpe Brown Whelan managed the IPO brilliantly – for insiders. They held theglobe.com. And when the market was primed by another incredible, unrelated Internet offering, EarthWeb, they made their move.

Last November, the IPO for theglobe.com was quickly dusted off. "We were up all night, trying to divide up friends-and-family allocations," says CEO Stephan Paternot, not knowing until the last minute whether the IPO would even happen. One such friend: steel-haired Miami Dolphins coach Jimmy Johnson. Another: Johnson's girlfriend Rhonda Rookmaaker.

Reportedly, they received 2,000 shares apiece at the \$9 offering price. Dolphins owner H. Wayne Huizenga is also a TGLO director.

Average Joes called up their brokers and put in market orders. The next morning, co-CEOs Paternot and Todd Krizelman paced the trading floor as Bear Sterns chair Alan "Ace" Greenberg did card tricks. The market traded for

hours before the orders could be tallied. Finally, the head trader shouted, "First trade \$90!" Within a few minutes the stock ticked up to 97. And then it started falling. It's claimed Johnson and Rookmaaker got out at 87. The stock closed at 63½, but continued to trade down.

Bear Stearns and Volpe Brown Whelan split over \$1,778,000 in fees.

They also placed

the stock with important clients, some of whom made a gain of 1,000 percent that first day. But theglobe.com's 93 employees sure didn't. Required to wait six months before selling, they must be trying hard not to watch the ticker.

"Net Geeks Strike Gold," the *New York Post* trumpeted. But for the average investor, TGLO was fool's gold.

– Cory Johnson

theglobe.com: www.theglobe.com.



Old-money insiders made out like bandits with theglobe.com, but the little guy hit the Wall.

Venture Capital

The Global Garage

When video-software developer Reality Fusion first knocked on the doors of venture capitalists, it got nowhere. So the company turned to the Internet, where it found Garage.com, a matching network for entrepreneurs and investors cofounded by former Macintosh guru Guy Kawasaki.

In December Reality Fusion became the first success story for Garage.com, which hopes to arrange start-up funding for 50 such companies this year. Garage.com fields business plans from high tech start-ups online and presents those that it feels are deserving to an impressive list of individual "angel" investors, venture capital firms, and corporate investors, including Microsoft, Hambrecht & Quist Venture Associates, and George Gilder. So far, Garage.com has fielded more than 3,000 first-stage applications, and in less than four months it has already whittled that list down to 12 clients it will promote.

Meanwhile, the Small Business Administration has also jumped into the game. In 1997, the SBA created the Angel Capital Electronic Network, or ACE-Net, an online resource for angel investors and for start-ups seeking between \$250,000 and \$5 million in capital. Unlike Garage.com, ACE-Net takes all comers who file the appropriate forms. Entrepreneurs need only fill out a federal Small Corporate Offering Registration Form, while investors need only prove they're officially accredited investors according to the Securities Act of 1933. The SBA's not-for-profit status prohibits it from screening start-ups or vetting investors, which may hobble its credibility.

Still, while the Internet may help bring entrepreneurs and investors together, the old adage about location, location, location is still relevant. "Our research has always indicated that angels invest within a half day's drive," says Jeffrey Sohl, director of the Center for Venture Research at the University of New Hampshire, which built ACE-Net. "Angels feel that they need to be close to the operation to monitor that investment." – Joe Nickel

Garage.com: www.garage.com.

Angel Capital Electronic Network (ACE-Net): ace-net.sr.unh.edu.

Tax Filing

Turbo Online

The annual IRS tango is getting easier – logistically, if not financially or emotionally. Intuit has ported its popular TurboTax program to the Web.

WebTurboTax replicates almost all of its shrink-wrapped cousin's features. Its Smart Interview System gathers all the information you need to file a return, from your name and address to the minutiae of your stock and fund trades. All the while, your total refund (or, egad, debt) is visible, so you can see the bottom-line effect of each deduction you claim. And if you hit a confusing spot – pretty likely, given the subject matter – you can consult FAQs that line every screen.

Rather than downloading software onto your hard drive, you need only create a password-protected account at the site; your data lives on secure Intuit servers. This means you can deal with, say, your salary and freelance income one weekend, save it, and come back weeks later to enter your investing information and medical deductions.

The app also links your federal and state returns – it has forms for each of the 44 states that extract income tax. There is one hitch, however. It can eat up system resources, so you should probably have a Wintel box running at 166 MHz or faster.

While you might still end up doling out dollars to the Man, using WebTurboTax will save you money in at least one way: At \$19.95 (including your electronic-filing charges) it's about 10 bucks cheaper than the version that lives in a box. Folks who qualify for the short-form return 1040-EZ can use WebTurboTax, and those who earned \$20,000 or less last year file free. Since you don't need to own a computer to use it, WebTurboTax also presents an opportunity for the Great Unwired to use the Net at their local library, or wherever else community access is available. Trite Net boosterism? It might be if it weren't true that those who file electronically tend to get their returns sooner. – **Steve Bodow**

WebTurboTax: www.webturbotax.com.

"The avoidance of taxes is the only intellectual pursuit that carries any reward."

– John Maynard Keynes

The Wired Index



Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
The Wired Index tracks 40 public companies selected by editors of *Wired* to serve as a bellwether for the new economy. For a complete description and the latest results, see stocks.wired.com. The Wired Index is not a traded fund or portfolio. Some of the companies in the Wired Index may have an advertising relationship with *Wired*. Readers who use this information for investment-related decisions do so at their own risk.

The Wired Investment Portfolio

Play It Again, Greenspan

Going into earnings season, it's time to buy. I'm picking up some FDX (aka FedEx), a huge beneficiary of ecommerce, as well as shares of recently minted IPO E-Tek Dynamics, a component supplier in the photonics biz. E-Tek's on a huge growth curve, boasts great management, and – get this – is raking in *profits*.

Parametric didn't come back strong enough,

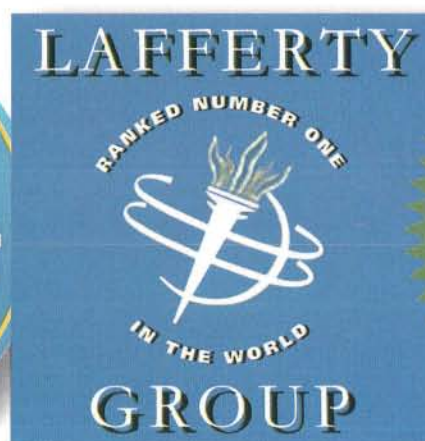
so it's out. Also, it's time to stop the losses on PeopleSoft and SAP (meaning I've put in an order to sell if they dip much lower). I'm sitting on laggards Ciena and MMC Networks, as I expect them to be bottom fished. And I'm sticking with big winners America Online, Cisco, Lucent, and MSFT.

– **Jeffery Wardell** (jwardell@hamquist.com)

Company	Primary Business	Symbol	Shares	Last Trade 1/4	Current Value	Δ Since Purchase
HOLDING						
America Online	Online services	AOL	4,000	149	\$596,000	+192%
Ciena	Optical networking	CIEN	5,000	14 3/4	71,563	– 34%
Cisco Systems	Network hw/sw	CSCO	4,500	95 3/4	428,906	+137%
Lucent Technologies	Telecom eqpt	LU	2,000	114 3/4	228,375	+ 73%
MMC Networks	Microchips	MMCN	15,000	12 3/4	189,375	– 30%
Microsoft	Software	MSFT	2,000	141	282,000	+ 68%
PeopleSoft	Enterprise sw	PSFT	4,000	19 3/4	79,000	– 39%
Pfizer	Pharmaceuticals	PFE	1,500	123 3/4	185,625	+ 25%
SAP	Enterprise sw	SAP	2,500	34 3/4	86,406	– 30%
SELLING						
SAP	Enterprise sw	SAP	2,500		0	0%
PeopleSoft	Enterprise sw	PSFT	4,000		0	0%
Parametric Technology	Design sw	PMTC	7,500	17	127,500	+ 3%
BUYING						
Federal Express	Freight delivery	FDX	1,250	86 3/4	108,281	
E-Tek Dynamics	Optical networking	ETEK	4,000	24 1/4	98,750	
Cash	\$548,187	Portfolio Value 1/4	\$2,902,468			
			Portfolio Value 12/1		\$2,556,688	
			One-Month Portfolio Performance		+ 13.52%	
			Russell 2000 Index		+ 5.65%	

Legend: This fund started with \$1 million on December 1, 1994. Profits and losses are reflected monthly, with profits reinvested in the fund or in new stocks.

The Wired Investment Portfolio (formerly TWITS) is a model established by *Wired*, not an officially traded portfolio. Jeffery Wardell is a senior vice president executive financial services representative for Hambrecht & Quist LLC and may have a personal interest in stocks listed in the WIP. The opinions expressed herein are those of the author and not necessarily those of H&Q's research department. H&Q has not verified the information contained in this article and does not make any representations to its accuracy and completeness. *Wired* readers who use this information for investment decisions do so at their own risk.



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WIRED

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EVENTS AND PROMOTIONS

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"WHAT DOES IT DO?"



Last month's answer: CardioWest Technologies' C-70 TAH, a bridge-to-transplant total artificial heart.



Competition Rules (See page 188.)

1. NO PURCHASE NECESSARY.
2. Entries for the Wired "What Does It Do?" Contest must be written on postcards. Each entry must state the entrant's name, address, and telephone number and correctly identify the item shown, and its function, in this month's installment of the "What Does It Do?" contest, according to the instructions given on the feature page.
3. Entries must be sent to:
 Wired "What Does It Do?" Contest
 Department 990301
 PO Box 10329
 Riverton, NJ 08076-0329.
 Each month's entry must be postmarked no later than the last day of the month on that issue's postal identification statement and must be received by the 10th day of the following month. *Wired* is not responsible for late, lost, damaged, postage due, or misdirected mail. Illegible entries will be disqualified. Mechanically reproduced entries and electronically placed entries are not eligible.
4. Only one correct answer will be registered per entrant per month. Contestants who have one registered correct answer at the end of the contest period (on or before January 10, 2000) will have one entry in the grand prize drawing; contestants with a total of two registered correct answers will have two; and so on. *Wired* reserves the right to discontinue the contest at any time, in which event the prize will be awarded based on entries received to date.
5. One grand prize winner of the "What Does It Do?" contest will be chosen on or before February 25, 2000, in a random drawing of qualified entries that have correctly identified items and functions in the "What Does It Do?" contests published in 1999. The winner will be notified by phone or mail within two weeks of the drawing. If the winner cannot be contacted within 30 days, an alternate winner may be chosen. All decisions by the judges are final.
6. The grand prize winner will receive a Harley-Davidson XL 1200S Sportster 1200 Sport. The grand prize is not transferable. No substitutions for the grand prize will be allowed except by *Wired* in case of unavailability, in which case a prize of equal or greater value will be awarded. The retail value of the grand prize is approximately \$8,500. The winner must have a valid driver's license that allows use of the prize, and is responsible for obtaining and providing evidence of insurance and for all registration, title, and other fees.
7. Income and other taxes, if any, are the sole responsibility of the winner.
8. The "What Does It Do?" contest is open to readers of *Wired* who are residents of the United States or Canada (excluding Quebec) and who are 18 years of age or older as of the date of entry, except for employees of Condé Nast Publications, the fulfillment house for this promotion, contributors to *Wired*, and the families of any of the above.
9. The Wired "What Does It Do?" Contest is subject to all federal, state, local, and provincial laws and regulations. Void in Puerto Rico, the Canadian province of Quebec, and where prohibited. In the event the winner is a resident of Canada, the winner may be required to correctly answer a time-limited arithmetical skill-testing question.
10. Odds of winning the "What Does It Do?" contest depend on the number of correct entries received.
11. All entries to the "What Does It Do?" contest become the sole property of *Wired* and the sweepstakes' sponsor, at *Wired's* sole discretion, and will not be acknowledged or returned.
12. Acceptance of the grand prize constitutes consent to use the winner's name and likeness for editorial, advertising, and publicity purposes (except where prohibited by law). The winner may be required to sign an affidavit of eligibility, as well as a liability and publicity release, which must be returned within 30 days of the date of notification, or an alternate winner may be chosen.
13. Contestants, by entering the "What Does It Do?" contest, agree to be bound by the above rules and regulations.
14. For the name of the grand prize winner, send a self-addressed, stamped envelope after February 25, 2000, to *Wired* "What Does It Do?" Contest Winner, 520 Third Street, San Francisco, CA 94107.

Electric Cars

◀ 129 Afterward, he and Wayland hung out in a sports bar with a third hot-rodder, Dennis Berubé (pronounced "beh-RU-bay"), whose electric vehicle was a true dragster – the kind with massive tires at the back, teeny wheels at the front, a hand-welded tubular steel frame, and a wedge-shaped body of flat aluminum plates. The three of them discussed creating their own affiliation: the National Electric Drag Racing Association.

A year later, NEDRA defied expectations by becoming a reality, with Wayland as president and Wilde as vice president. In a summit meeting attended by EV advocates from across the country, they hammered out rules and safety regulations that have been recognized by the National Hot Rod Association (NHRA). A whole new racing category now exists for the "amp suckers."

Poised to go mainstream, NEDRA started its own drag races in Woodburn, Oregon. And I decided to check them out. Clearly, this would be the best opportunity to evaluate NEDRA's chance of fulfilling Wayland's dream: to bury the stodgy environmentalist heritage, transform EVs into fetish objects for speed-hungry teens, and bring about a green revolution in garages across the US.

Forty miles south of Portland I take the Woodburn exit from I-5 and follow a two-lane blacktop across flat wheat fields punctuated with barns and old wooden farmhouses. After a couple of miles I find the Woodburn Dragstrip: a two-story control tower, a concession stand, and a few tiers of sun-warped bleachers beside a scarred stretch of asphalt that stretches away into the haze.

Today, Friday, a marquee-style sign outside the strip proclaims "Street-legal drags." This means that any Camel-smoking, Bud-drinking, tire-kicking farm boy can bring his hopped-up 1970s gas-guzzling muscle car and run fender-to-fender down the quarter mile in an all-American folk ritual straight out of a James Dean movie.

The electronerds aren't scheduled till tomorrow – but some of them are turning up anyway. Dennis Berubé is here, unloading his purebred dragster from a long, white, professional-looking box-shaped trailer that he's hauled from his home in Arizona. The navy blue racer is decorated with spiffy electric-discharge patterns in special reflective paint. On its rear, in block letters just above a big on/off switch, is a challenge: "\$1,000 TO ANY ELECTRIC QUICKER." Berubé's car holds the

current world speed record for any electric vehicle, and he has a standing cash offer to anyone who can shut him down.

He's suntanned, amiable, low-key, without the edge that you'd expect from a speed maniac. In fact his modest manner and large-lensed glasses make him look like a clerical worker – although the appearance is deceptive. "I've always liked drag racing," he says. "When I was a kid I raced electric slot cars. I'd tweak them and soup up the motors, race against other kids in the neighborhood – and take their cars home with me."

His first real car was a '65 Buick Grandport, which he raced in suburban Connecticut. "I used to run every Friday night with maybe 1,000 people, right on the freeway. The cops would be there, but there were too many of us for them to do much about it. We'd make the windows rattle on the McDonald's. You could get 120-octane Sunoco back then, for 29 cents a gallon." He smiles at the memory.

One night, when he was driving alone, a couple of patrol cars pursued him. "I tried to outrun them. I made a turn onto a side street, but at the end of it was an entrance to a football field, with two steel posts. I had my lights off, and I ran right into both those posts. They mashed both my fenders, all the way up to my doors. I was just jammed in there and couldn't get out, and the cops arrived and started laughing at me. They'd given me tickets before for speeding and reckless driving. After that I wasn't allowed to drive for four years, so I went into the Air Force."

MORE JUICE

National Electric Drag Racing Association

www.nedra.com

Electric Vehicle Association of the Americas

www.evaa.org

EV discussion list archives

www.crest.org/ev-list-archive

Auto manufacturers

www.chrysler.com

www.ford.com/electricvehicle

www.gmev.com (General Motors)

www.toyota.com

www.honda.com

Battery manufacturers

www.optimabatteries.com

www.hepi.com

www.kilovac.com

Eventually Berubé relocated to Phoenix, where he started his own welding repair business. "In 1991 I had a service call at a racing shop where they built dragsters. I repaired their welder in five minutes and talked to the guy for three hours about an electric dragster. I said, 'Let's do it!' So they built it for me – an orthodox chassis to NHRA supercomp specs. I have 28 batteries, giving 336 volts at 1,200 amps. The cables are about an inch in diameter."

So far, the car has cost him about \$90,000, but it's cheaper and easier to run than a comparable gas-powered dragster. There's less maintenance and no tune-ups, and after each race a recharge from his portable generator costs about 30 cents.

I ask him how the car feels when he takes off. "It's a kick. I cover the first 60 feet in 1.3 seconds. You feel the acceleration pull your face back. I do one-eighth of a mile in 6 seconds, reaching 105 mph. The last eighth, the performance falls off because I have no transmission. There's so much torque from the motor, it cracks gears."

Like others in NEDRA, Dennis Berubé is an eco-evangelist. "When people see my car, they realize electric cars don't have to be like golf carts. So, this is the right thing to do – for ecology, and to get kids interested in the whole idea."

Naturally I want to drive the dragster, and Berubé sees the look in my eye. "You can take it around the pit area if you want," he says, trying to sound offhand about it.

Well, all right! I squeeze into the seat, scraping my knees on the aluminum body and bumping my head on the roll bar. "Whatever you do," says Berubé, pointing to a button mounted on one spoke of the tiny steering wheel, "don't touch that. Don't even think of touching it. That would initiate the race sequence." In other words, the car would hurl itself forward under control of a program optimized to run the quarter-mile in just over 10 seconds.

"If you do touch it," he says, after a thoughtful pause, "just hit that switch over there." He points to a toggle switch that's barely accessible at the far left of the cockpit. I imagine myself fumbling for it as the car winds up and shoots toward the chain-link perimeter fence 400 feet away. Probably I could hit the switch around the same time the car hit the fence.

Still, this is no time to wimp out. Berubé shows me another button (close to the one that I'm not supposed to touch), which will nudge the dragster along gently. I press it, and the car rolls forward. There's no suspension, so I feel every crack in the asphalt. The dragster makes an electric 166 ▶

Electric Cars

◀ 165 grinding noise, like an old-fashioned streetcar.

The "pit area" at Woodburn is a desolate expanse like an abandoned parking lot. I trundle around it at 25 miles an hour, hauling on the steering, uncomfortably aware that I'm guiding the most precious object in Dennis Berubé's entire life. Finally I wrestle it back to his trailer.

A couple hours later the gas-guzzlers arrive: Mustangs, Camaros, GTOs – all pre-1980 – fitted with monster V-8s. The race fee is only 20 bucks, and you can make as many runs down the track as time permits. I walk among the cars as they line up with their engines rumbling, while the drivers' girlfriends sit on the bleachers eating corn dogs and drinking 7-Up. Then the racing starts, and it sounds as if tigers are being tortured here among the wheat fields. Screaming tires, roaring motors – it's a testosterone-fueled, head-hammering ritual as the drivers pair off like elk's banging their antlers together at the start of the mating season.

"Still makes my knees tremble just like I was a teenager," says a 45-year-old driver who resumed racing when his sons got old enough to challenge his alpha-male status. Bearing in mind that "knee trembler" was 1960s Liverpoolian slang for a stand-up blow job, it's no surprise to see the vocabulary of fuel injection and blowers (superchargers) perverted in a dashboard sticker that reads, "Injection is nice, but I'd rather be blown."

In fact, this event reeks even more of sublimated sex than of exhaust fumes – and the noise is an intrinsic element. "In my opinion," says a veteran race watcher, "the guys whose vehicles make the most noise have the shortest dicks."

Into this bastion of heartland macho posturing comes mild-mannered Dennis Berubé, edging his car up to the start line. He spins the fat tires to warm the rubber for better adhesion, and then – he's gone! His dragster drifts away like a bird on the breeze, easily outpacing his rival, a 5-liter behemoth that bellows futilely as it falls behind.

The electric scoreboard shows that Berubé turned the quarter in less than 11 seconds. The gasoline-car drivers look at each other as if to say, *What the fuck?*

If a man with a high-powered rifle wandered into a primitive tribe where they'd been duking it out with wooden clubs, I imagine the reaction

would be the same. The technology gap is so extreme, it makes the whole game seem pointless. After Berubé returns to the waiting area, a few drivers wander over and check his car with hard, calculating eyes; but most try to pretend that it doesn't exist. "Sure would be embarrassing to get my doors blown off by that thang," one kid mutters.

The next day – Saturday – the gas-guzzlers are gone and the pit area is invaded by smart, hairy geeks swigging Evian water and chattering jargon like speed freaks. Every one of them is male, except for some wives and girlfriends. Yes, the electronerds are here – and the bleachers are empty. The event was listed in the track's calendar, but the locals have chosen to stay home.

Still, there's no shortage of cars and drivers. Roderick Wilde's Maniac Mazda RX7 is a fearsome

Wayland's tricked-out Datsun will have 1,000 watts of audio. The plates will read "V8 BASS."

creation, crammed full of batteries and looking slightly beat-up, like a prize fighter with a history. John Wayland has brought his White Zombie, cranked to a higher voltage and plastered with slogans: "We blow things up so you don't have to ... Question internal combustion ... Plasma Boy Racing." Wayland got his "Plasma Boy" appellation a few years back when he shorted out some batteries with a carelessly dropped wrench. The explosion generated a terrifying ball of blue plasma crackling with electric discharges.

Not far away, Don Crabtree, a sewing-machine design engineer, stands by his record-breaking 144-volt motorcycle powered by wheelchair batteries. "This was the quickest thing we could throw together to get down here and play," he says. "It cost me about \$300."

I wander over to a red Toyota MR2, as shiny as if it just came out of a showroom. Its owner is Bob Boyd, a white-haired Air Force veteran.

"Previously I built a Formula One racer," Boyd says, but he's talking about planes, not cars. "An international Formula One has to weigh at least 500 pounds," he explains. "Mine was the second fastest – but I'm tired of Formula One airplanes. This is more fun."

Boyd was shot down over Italy during World War II. He retired 24 years ago, but at 78, he still loves speed and, like most electric racers, is a

self-taught engineer. "When I was a kid, out on a farm, you couldn't afford the two bits an hour to hire someone to do something for you. So, you learned to do it yourself. Kids who grow up around farms are pretty handy with tools."

He consulted John Wayland before tackling his project, then spent about 18 months working on it. "The winters are long in Idaho where I live, and you can only do so many crossword puzzles. So, I built this for fun. It draws up to 1,200 amps from 16 batteries, 192 volts. To recharge it, I just plug it into a standard 220-volt outlet."

Boyd's car is immaculately executed; the only clue that it's not a regular Toyota is the electric plug hiding where a gas filler pipe should be. Boyd financed the conversion without any sponsors. "When you get to be my age you've paid for everything already. I have probably \$1,000 a month left over that I don't really need. So, I took a pretty nice car and tore it up, converted it. You

could do the same thing a lot cheaper."

His maximum range is 40 miles between recharges, but he feels this is perfectly adequate. "Almost every family in the United States owns two or more cars, and most of them never drive more than 20 miles a day. Why don't they drive an electric? It's a whole bunch cheaper, like burning fuel at 14 cents a gallon. And of course it's nonpolluting."

"Less polluting" might be more accurate, because the electricity has to be generated somewhere. But the open combustion of coal or natural gas in power stations is inherently more efficient than an internal combustion engine, which creates noxious gases and a huge amount of waste heat. Also, as Boyd points out, hydroelectric power produces no pollutants at all. Therefore, electric vehicles really do have the potential to reduce emissions nationwide. Also, if millions of Americans went electric, existing power plants might still satisfy the demand, because most recharging would be done at night, when the load is lowest.

I question Boyd about the valuable metals locked up inside batteries. In response, he claims that the modern lead-acid batteries used in almost all amateur car conversions are 95 percent recyclable.

When I talk to other builders at the event, 168 ▶



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Electric Cars

◀ 166 they give me the same well-practiced pro-electric sales pitch – and it's persuasive. Not all the vehicles are finished as meticulously as Boyd's, but most are good-looking and practical. They really could replace conventional automobiles under many everyday conditions.

Racing, though, may not be the killer app that the advocates are looking for. The cars move so silently, you can forget that anything's happening on the track. It's like an action movie with the sound turned off. Even when I walk to the far end where the cars hit terminal velocity, Berubé's dragster rolls past as unimpressively as a commuter train.

Up in the control tower, I ask the track owner which of his events attracts the biggest crowd. His answer is no surprise: Most people want to see insanely powerful, nitro-fueled monsters that shoot jets of flame out their pipes and make so much noise that you feel your internal organs vibrating in sympathy.

Electric-powered race cars have novelty value – maybe even shock value – among auto

Automakers vs. Backyard Mechanics," page 129), probably because the manufacturers don't believe a viable market for electric cars exists.

Toyota and General Motors have made the most serious investments, but Toyota spokesperson Jeremy Barnes freely admits that "we're not expecting to make a profit from EVs." So why is the company selling them? "Because of legislation," Barnes says. "And because it's the right thing to do for the environment," he adds quickly.

During the past decade GM has spent close to \$700 million developing electric vehicles and others that use alternate power sources, including natural gas. But Jim Evans of GM's Advanced Technology Vehicles Division says, "We don't expect a return now. We're working on getting the cost curve down."

This is a bizarre situation. Amateurs are building affordable electrics, while huge corporations seem unwilling or unable to do so. The reason is simple: Manufacturers are obsessed with maximizing the distance an EV can travel between recharges.

According to Toyota's Barnes, "Our market research shows that the greatest concern of

car, engineers simply put an electric motor into a preexisting sport-utility vehicle, the RAV4. But to overcome its high weight and wind resistance they installed nickel metal hydride (NiMH) batteries, which are insanely expensive. Toyota offers a replacement set for \$20,000 but admits that this is a "subsidized" price. In other words, they're selling the batteries at a loss. The company won't say what the real cost is, but EV advocates guess that it could be \$50,000, which is more than the sale price of the entire vehicle.

If that seems a bit extreme, consider this: Toyota has also developed a futuristic five-seater named the Prius, which contains a 1.5-liter gasoline engine in addition to its 30-kilowatt electric motor. This hybrid design, scheduled to be marketed in the United States in 2000, is claimed by the manufacturer to generate one-tenth the emissions while getting double the gas mileage. The electric motor contributes power for acceleration, while the gasoline engine recharges the batteries when the car cruises. This increases the claimed range to more than 800 miles – but the dual system adds cost, complexity, battery weight, and potential maintenance problems. No one believes it can be sold at a profit.

Overall, despite heroic efforts and a money-is-no-object attitude, manufacturers of pure EVs are still hampered by range limitations. So why not do what the amateurs have done: Admit that EVs are unsuitable for long distances, and design them within that limitation. After all, if you're contemplating a cross-country trip, it doesn't matter whether the range is 40, 80, or 120 miles; you're not going to use an electric vehicle.

For routine chores, electrics make sense. As Bob Boyd points out, in most two-car families, one car is used mainly for grocery shopping, commuting, or taking the kids to school, and a local range is probably adequate. The backyard builders have acknowledged this. As a result, their electrics need fewer batteries and are lighter, faster, more roomy, better-handling, and much, much cheaper.

John Wayland would like to see auto manufacturers offer something like a Dodge Neon fitted with the same simple type of DC motor and battery pack that the amateurs have been using. He figures that the empty shell of the car (which EVers call the "glider") probably costs about \$6,000 to fabricate. "They could put in a motor and batteries, keep the same transaxle, and make a profit selling it for \$20,000 or maybe less. People would buy it because it has no pollution, no vibration, better acceleration, less maintenance, and

"My Mazda is insane on the street – if you nail it, you end up going sideways."

aficionados, but they remove fetish elements that are deeply embedded in car culture. When you suppress the animal growl of a hot rod and quench its stinking breath, you emasculate it – and the drama dies.

Electric dragsters seem unlikely to grab much airtime on ESPN. They can still serve an important function, though, because auto racing has always been a test bed for new technologies that eventually find their way into consumer products.

Roderick Wilde claims he once met a Ford engineer who had been sent by his company to check out EVs at racing events for the past several years, looking for adaptable ideas. In 1998 Wilde even received a call from Toyota for information about battery performance in cold climates. "Hot-rodders have always pushed the envelope," John Wayland agrees, "doing stuff that Detroit stylists and engineers never thought of. I certainly believe that the same thing can happen in electric vehicles."

One day, maybe; but not yet. Auto manufacturers lag far behind the amateurs in terms of performance, price, and practicality (see "Big

potential customers is range." Other EV advocates agree: The first thing anyone asks is usually, "How often do you need to plug it in?"

Batteries are the problem. Two gallons of gasoline weigh about 18 pounds and will take you 60 miles in a typical economy car, but you need 900 pounds of the most modern lead-acid batteries to achieve the same result. That's a 50-to-1 weight-ratio penalty.

Auto companies have used extreme measures to address this issue. GM's EV1 uses exotic composite materials and even titanium components to reduce weight. Its special tires minimize rolling resistance. Its AC motor is fractionally more efficient than the cheap DC units favored by amateurs, and its regenerative braking recharges the batteries when you slow down. These state-of-the-art options add a huge amount to the cost of the car, while increasing its range only to an average of 80 miles between recharges.

Toyota has followed a path that seems more practical at first glance yet still results in a vehicle that's too expensive to be profitable. Instead of spending millions perfecting an ultraefficient

you don't have to go to the gas station. You know, people always say, 'Isn't it inconvenient to have to plug in your car?' Well, I think it's inconvenient to have to go out on a cold winter day, drive to a gas station, and pay a substantial amount of money to fill the tank."

Recharging is still an issue, because most EVs require a 240-volt power supply, which isn't easily available when you're on the road, and you have to wait an average of three hours to replenish totally dead batteries. In the future, however, this might change. A new generation of EVs could use 480 volts, which would enable much faster charging. In most areas of America, voltage is stepped down to 110 or 220 for domestic use via transformers on utility poles. But the power lines on those poles typically carry about 12,000 volts. Therefore, 480-volt outlets could be installed quite cheaply in gas stations, rest areas, motels, and truck stops. If you could recharge your car in 20 minutes – in the time it takes to eat a hamburger – EVs would begin to seem usable not just for local trips, but for long distance travel.

This is a far-fetched fantasy. Back here in reality, manufacturers have made their EVs so expensive to build, they seem to be trying to sell as few as possible. GM takes the prize in this respect by offering the EV1 only on a closed-end three-year lease to customers who satisfy onerous demographic criteria. Result: Only 550 EV1s are on the road so far.

When pressed to explain how the corporation will continue developing a car that defies commercial common sense, Jim Evans responds vaguely: "We're developing a family of products. It's really too early to determine whether electric or hybrid vehicles are going to play out." He does mention that the EV1 is being equipped with NiMH batteries – but this of course will make it even more expensive, while adding perhaps 50 miles to its range.

The amateurs, meanwhile, are out there pushing the limits of EVs in their own gung-ho fashion. Dennis Berubé has tweaked the performance of his dragster, establishing a new world record of 10.33 seconds for the quarter mile and a terminal speed of 123.47 mph. Meanwhile Roderick Wilde is planning the most extreme project yet: a car drawing at least 2,500 amps at 400 volts. That would be 1 megawatt, approximately equivalent to 1,000 net horsepower. The car will contain at least four motors, and Wilde claims that by the time you read this, a solid-state controller will be perfected to handle all that current. "We intend to go over 200 miles per hour,"

he says. "We'll take it to Bonneville and get it officially timed. It'll be the fastest street-legal electric car."

Street legal?

"Sure," says Wilde. "You can't have a 1,000-horsepower gasoline car on the street, because it couldn't satisfy emission regulations. But a 1,000-horsepower electric car generates no emissions. It can be legal. Of course they'll find some way to outlaw it sooner or later, because it's too potentially dangerous. I mean, even my Mazda is already insane on the street – if you nail it, you end up going sideways." He laughs happily.

John Wayland is cruising in a different direction. His next project is a tricked-out '66 Datsun minitruck with an electric motor mounted at the rear, leaving the front engine compartment empty. "I figure I'll put eight subwoofers in there with a transparent plexiglas top," he says. "That was my wife's idea: our version of a V-8. I'll have 1,000 watts of audio, from twin amplifiers powered by twin baby Optima batteries, recharged by twin DC-DC converters from the high-voltage battery stack located in the rear under a remote-controlled electric tilt bed. The paint job will be grape-jelly purple, with 17-inch wheels and LED

sequential-flashing turn signals. I'm going to call it Purple Phaze."

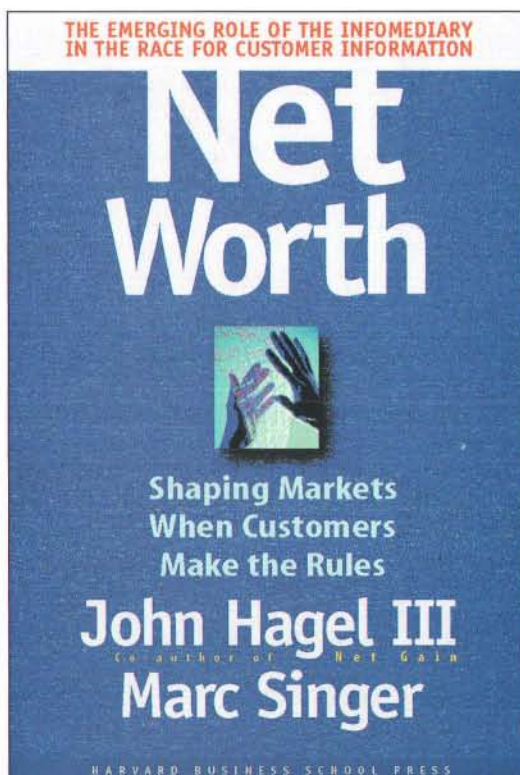
Already, he has the custom license plates. They read "V8 BASS."

Outside his brick-and-lap-siding home, Wayland surveys his two electric cars, three electric pickup trucks, and one electric lawn tractor parked along his driveway and inside his garage – where shelves are packed with spare batteries, and racing trophies form a glittering shrine beside a toolbox and a drill press. All of the vehicles are immaculately clean and meticulously engineered. All are silent, economical, and non-polluting. And all (except for the lawn tractor and a red pickup built more for range than speed) give you that kick in the ass when you press the pedal to the metal.

"I'm telling you in all seriousness," Wayland says, "we're going to change the face of electric cars."

He's been reciting this mantra for almost 20 years. But as other car builders become infected with his obsession, consumers just might begin to reconsider their obsession with range and start demanding electric cars that make sense.

If that actually happens, Wayland may turn out to be right. ■ ■ ■



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The Undead

◀ 145 Even now, when a dozen microprocessors are embedded in every new car, the punch card remains embedded in some of Ford's assembly lines.

"We're on the very last legs of using cards," says Larry Roguski, data processing manager at a Ford assembly plant in Saint Thomas, Ontario, a thrumming auto-hive about 150 miles northeast of Detroit. "We still have an IBM card reader, card punch, a couple of 083 sorters, and a couple of 129 keypunches." The data, which concerns the manufacturing status of each car, is sent electronically to headquarters by loading the cards in a mainframe and sending it out through a front-end processor to a mainframe in Detroit. "The cards themselves do not leave the plant," says Roguski.

Another punch-card user is the US Department of Agriculture's Cotton Division, in Memphis, Tennessee. "They have 14 card punches in operation that are used about five months out of the year," says Merritt Moon, a former head of automatic data processing. "We used to punch 15 to 18 mil-

lion cards a year." Lately that's declined to roughly 400,000.

In the USDA operation, each card represents the "quality data" for one bale of cotton – a phrase that refers to cottony attributes like color and length of fibers. Each bale goes to a USDA classing office, gets graded, and then (somewhere else and sometime later) is sold. The USDA estimates that of the 18 million bales of cotton that will be classed in a typical season, about 1 or 2 percent will be recorded on punch cards. "We would have liked to get out of it," says Moon, sounding the "maybe next year" plaint. "But we still had a few customers who were holding on to these old punches."

On a much smaller scale, punch cards also remain popular among a handful of country clubs. "We're one of the last survivors, as far as I know," says Wayne English, an official with Club Technology in Irving, Texas, a company that provides software services for the private club industry. Some clubs still use punch cards as "chits" or "tickets" that are signed by the club member for dinner, drinks, and golf-course doodads. The cards are keypunched and read into a computer

to produce a billing statement. "At the end of the month we sort the cards by account number and return the original," says English. "The signed tickets go back to the member with a statement."

Why does such a kludge-like system hang on? "It's your old-line clubs, your wealthier members-type clubs where dues are anywhere from \$200 to \$500 per month, and when members pay those kind of dues they want to get what they want. And these members want their ticket back with their statement."



As a student of technology less tantalized by the software (the cards) than the hardware (the machines), I return to Card-amation for a longer tour of the factory innards. I'm taken around by Bill Nagle, an energetic hardware-and-software virtuoso who has worked at the place nearly 20 years. As we roam wide corridors stacked high and deep with equipment, I'm reminded of childhood visits to the American Museum of Natural History in New York. Here, too,

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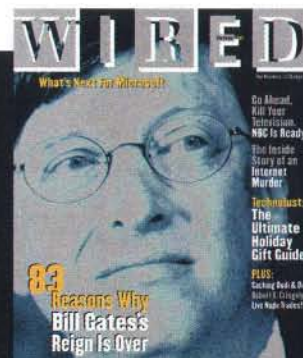
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we have entered the hall of large reptiles, full of mighty machines enamel-skinned in dark green or gray.

Nagle stops to admire a really sizable piece of equipment. "An IBM collator, just sitting here, in case someone needs parts," he says. "Over here's an IBM 129 – the classic."

The IBM 129 is the workhorse of key-punches – the machines at the front lines of the digital revolution, cutting those perfectly rectangular holes in punch cards, translating everything from tax returns to poetry into ASCII text. Nagle hands me a spare punching head from the RP series, a unit that combines the heft of a machine tool with the precision of a watch. "A carborundum wheel slides the card, keeps the card tight and moving through there," he says, explaining how the card is fed through the punch station. Then he points to a set of razor-sharp blades. "There's the knives, quite a work of art. Made to keep on going."

Nearby, at a well-equipped workbench, a 26-year-old technician named Chris Wojakowski is assembling a CF300 card reader. "I've been in electronics since high school, went to tech school right up the

road," Wojakowski tells me. "I went into the Navy, worked on F-14s, from radar to bombs. When I came here I remember walking in and thinking, 'Man, people still use this stuff!' I had seen a special on the Discovery Channel about the dawn of the computer age, and here it was."

Wojakowski's refurbishing job begins with him selecting any one of dozens of rebuildable machines stacked in back. "You've got to strip it all the way down," he says. "All the belts and rollers get replaced, new rubber, modifications to the plate under here because these rollers are not exactly the same. This is day four of this machine."

Wojakowski starts the card reader. "Oh, that's quiet!" he coos. "You don't get them like that a lot. That's nice!"

Elsewhere, James Alvord, who has been at Cardamation since 1983, is running diagnostics on a partially assembled sorter. Alvord, a no-nonsense man, is the master of all things electromechanical. He knows every machine down to its most inaccessible parts. He is the card whisperer.

He introduces me to a series of machines, starting with an IBM 084 sorter. "This 172 ►

GREMLINS: PUNCH CARDS AND Y2K

One legacy of punch cards is 1999's infamous global headache: the Y2K problem. Y2K happened, in large part, because the space restrictions of a typical 80-column punch card put a premium on digital thriftiness, inspiring programmers to economize wherever they could. The fatal space-saver, of course, was the widespread decision to represent years using two digits instead of four – the binary poison pill at the heart of Y2K. Ironically, Y2K may help punch cards survive into the 21st century. Bob Swartz believes many companies that would like to abandon punch cards are now unable to hire the old-school programmers who could help them make the switch. Why? Because they're all busy working on Y2K.

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The Undead

◀ 171 will do 2,000 cards per minute. Now, this here is the CR300. It can run up to 600 cards per minute. I probably built 100 to 200 of these in my day, from scratch, piece by piece, part by part. I had that thing memorized, part numbers and everything."

We return to a sorter that Alvord is repairing. It sorts cards one column at a time, delivering them to 11 individual trays. "If the cards aren't perfectly flat," says Alvord, "it'll cause a lot of jams. Even the humidity in the air will affect the cards. You can have it running perfectly now, and then by the third day it just goes down hard."

Alvord is preparing for a major sorting job – a shipment of 70,000 cards from an East Coast metropolitan housing authority. He figures the sort will probably take a week or two, nonstop.

Now, he's ready to test the sorter. He loads it with a deck of cards and lets it run. Watching the machine is like watching a Las Vegas card dealer, vastly speeded up. The cards come shooting down the belt and flutter, effortlessly, into place, and it dawns on me that this is precisely the image I've conjured to visualize modern packet-switching. When you send a message over the Internet, it's broken up into a deck of separate packets that are reshuffled independently throughout the network and then resorted at the other end. As I watch the cards fly, I know that this is exactly what is happening – at megacycles-per-second rather than cards-per-minute – to billions of information packets all over the world.

Later, I mention this notion to Paul Baran, the telecommunications pioneer who developed high-speed packet switching at Rand. He likes the analogy, and recalls the role cards played when he was writing programs back in the '60s. "When I was exploring how a distributed network would behave under stress," he says, "the programs' characters were transcribed by an operator at a keypunch machine that punched out the requisite holes in the 80-column IBM cards."

It's a nice way to visualize it. Punch cards and packets involve twin processes – separated at birth, but related to the end. ■ ■ ■

The Inner Bezos

◀ 121 enough of a personal fortune to build his own space station. Reminded of those concerns today, Bezos laughs but quickly turns serious. "I wouldn't mind helping in some way," he says. "I do think we have all our eggs in one basket."

Achieving his astronaut goals meant succeeding at school, and Bezos would show as a teenager that behind the easygoing façade and booming laugh was a relentless, even intimidating, work ethic, one that has become his hallmark at Amazon.com. "He was always a formidable presence," says Joshua Weinstein. When Bezos made clear his intention to become class valedictorian, for example, Weinstein says everyone else understood they were working for second place. Besides securing the valedictorian's title, Bezos was also one of three members of his graduating class awarded a Silver Knight Award, a prestigious academic honor in south Florida high schools, sponsored by Knight Ridder's *Miami Herald*. (Pilgrimage note: One of the few remaining talismans of Jeff Bezos's presence at Miami Palmetto is an oak board, in a glass display case cluttered with sports memorabilia just inside the school's front door, that holds the names of Silver Knight winners.)

Bezos got his first taste for retail during this time, spending one summer as a fry cook at McDonald's, studying the company's automation improvements even while he responded to the Pavlovian cues of the many and often simultaneously sounding buzzers that told him when to scramble his eggs, flip his burgers, and pull his fries out of the boiling vat. "Now, actually, the french fries raise themselves up out of the oil," he says, "which let me tell you is a major technological innovation! Ah-ha-ha-ha-ha-ha!"

In an attempt to avoid a second summer in the grease pit, Bezos, with Uschi Werner, embarked on his first serious entrepreneurial effort: a summer-education camp for fourth-, fifth-, and sixth-graders that the two labeled the DREAM Institute. (DREAM stood for Directed REASONING Methods.) Six students signed up for the \$600 camp; two of them were Jeff's own brother and sister.

The program, prophetically, emphasized a mix of science and literature, the future and the past. Required reading included *The Once and Future King*, *Stranger in a Strange Land*, *The Lord of the Rings*, *Dune*, *Watership Down*, *Black Beauty*, *Gulliver's Travels*, *Treasure Island*, and *David Copperfield*, along with the plays

Our Town and *The Matchmaker*. The science curriculum ranged from fossil fuels and fission to space colonies and interstellar travel – with a dollop of television and advertising study thrown in for good measure. "Our program," the budding entrepreneurs wrote in a "Dear parent" flyer generated on Jeff's Apple II and a dot-matrix printer, "emphasizes the use of new ways of thinking in old areas."

Jeff and Uschi's long distance relationship didn't survive his matriculation at Princeton, but their entrepreneurial exploits nonetheless helped Bezos overcome his first serious intellectual disappointment. Intent on becoming a theoretical physicist and following the likes of Einstein and Hawking, he discovered that although he was one of the top 25 students in his honors physics program, he wasn't smart enough to compete with the handful of real geniuses around him. "I looked around the room," Bezos recalls, "and it was clear to me that there were three people in the class who were much, much better at it than I was, and it was much, much easier for them. It was really sort of a startling insight, that there were these people whose brains were wired differently." The pragmatic Bezos switched his major to computer science and committed himself to starting and running his own business.

In his senior year, Bezos turned down job offers from Intel, Bell Labs, and Andersen Consulting to join a start-up called Fitel, which had run a full-page ad in *The Daily Princetonian* soliciting the school's "best computer science graduates." The company, launched by two Columbia professors in the days when VANS and EDI were hot topics, was attempting to build an ambitious worldwide telecommunications network for trading firms that would help them clear and settle cross-border equity transactions – piggybacking atop General Electric Information Service's network alongside GENIE, GE's early consumer online service.

Bezos was employee number 11. His success at debugging spaghetti code earned him rapid promotion to head of development and director of customer service, which entailed a weekly commute between New York and London, where his divisions were located, aboard discount airline People's Express. "This is not," he says, "the right way to organize a start-up company, just for the record. Ah-ha-ha-ha-ha-ha!"

After nearly two years of failed attempts to grow Fitel, Bezos bailed out for a more stable job as a product manager at Bankers 173 ►



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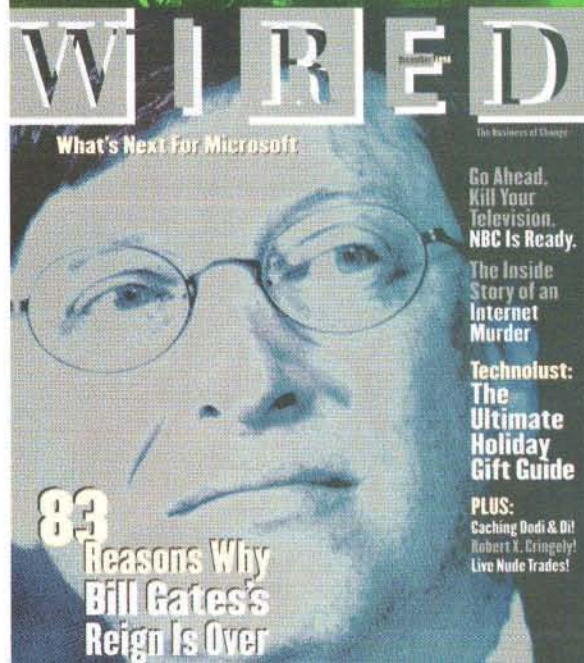
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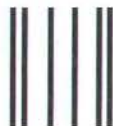
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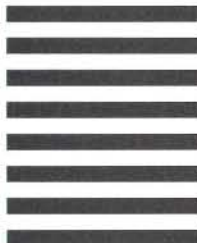
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The Inner Bezos

◀ 172 Trust. There, he sold software tools to the company's pension-fund clients, but he also explored outside projects. At one point, he collaborated briefly with a Merrill Lynch consultant named Halsey Minor (who would later become well known as the founder of CNET) on an abortive plan to start a company that would use then-fledgling software agents to create a personalized news fax for financial professionals. By 1990, however, after only two years at Bankers Trust, Bezos was circulating his résumé to headhunters with the express goal of escaping financial services for a technology company, where he could pursue what he had decided was his "real passion," using computers and so-called second-wave automation to revolutionize business.

Then a headhunter called, telling Bezos, "I know you said you would kill me if I even proposed the finance thing, but there's this special opportunity that's actually a very unusual financial company." It was the two-and-a-half-year-old hedge fund firm D. E. Shaw.

David Shaw, like Bezos, was a computer scientist. His specialty was devising new trading strategies for particular financial instruments. The two clicked immediately, with Bezos finding Shaw "one of those people who has a completely developed left brain and a completely developed right brain. He's artistic, articulate, and analytical. It's just a pleasure to talk to someone like that." Shaw, in turn, thought his 26-year-old hire "fantastic," a "pleasurable person to talk to" who was "also very entrepreneurial."

Four years later, Bezos had worked his way up to senior vice president, one of four at the firm. He'd also devised a plan for his personal life.

"At a certain point I was sort of a professional dater," he explains about his years in New York. His systematic approach to the quest for a permanent relationship was to develop what he labeled "women flow," a play on the "deal flow" Wall Streeters try to generate to locate worthwhile investments. In managing their deal flow, bankers will set limits like "I won't look at anything under a \$10 million equity investment." The limitation Bezos set for friends producing candidates for his "women flow" was more esoteric. "The number-one criterion was that I wanted a woman who could get me out of a Third World prison," he says.

"What I really wanted was someone resourceful. But nobody knows what you mean when

you say, 'I'm looking for a resourceful woman.' If I tell somebody I'm looking for a woman who can get me out of a Third World prison, they start thinking Ross Perot – Ah-ha-ha-ha-ha-ha! – they have something they can hang their hat on! Life's too short to hang out with people who aren't resourceful."

His self-deprecatory explanation for asking friends to set him up on blind dates is that "I'm not the kind of person where women say, 'Oh, look how great he is,' a half hour after meeting me. I'm kind of goofy, and I'm not – Ah-ha-ha-ha-ha-ha! – it's not the kind of thing where people are going to say about me, 'Oh my God, this is what I've been looking for!'"

As it happened, women flow did not produce the desired result. Instead, he fell in love with a member of his own staff. The future MacKenzie Bezos was a research associate who had been an assistant to novelist Toni Morrison while studying at Princeton. MacKenzie – whose first novel will be published by Random House later

that would enable Bezos to offer books online through the virtual retailer he envisioned creating.

But David Shaw and others at the firm weren't ready to make books a priority. After consulting initially with another partner, Bezos approached Shaw to tell him he had been bitten by the entrepreneurial bug and wanted to leave. Bezos says he kept staring at the Net's 2,300 percent annual growth figure and placing his thoughts within what he calls a "regret-minimization framework." "When I'm 80," he asked himself, "am I going to regret leaving Wall Street? No. Will I regret missing a chance to be there at the beginning of the Internet? Yes."

"Let's take a walk," he recalls Shaw saying, and the two of them set off for Central Park. Shaw, while acknowledging that he himself had left an established business to pursue entrepreneurial dreams, tried to impress on Bezos what he would be giving up by leaving; not just financial security but a pivotal role

"When I'm 80," he asked himself, "am I going to regret leaving Wall Street? No. Will I regret missing the beginning of the Internet? Yes."

this year – and Jeff were married in 1993. A year later, Shaw put Bezos in charge of exploring new business opportunities in the burgeoning world of the Internet.

It was while brainstorming ideas in the then-unfamiliar area of electronic commerce that Bezos came to his deceptively simple conclusion: The most logical thing to sell over the Internet was books, largely because two of the country's largest book distributors already had exhaustive electronic lists.

As Amazon.com has long since established, no single bookstore, even a superstore, can carry a comprehensive inventory of the books in print. The distributors, carrying thousands of titles, in effect act as the warehouse for most stores, particularly smaller independent booksellers. When customers ask a store for a book it doesn't have, the first place many of them will turn to fill the customer's order is Ingram or Baker & Taylor, the two largest distributors. These companies' inventory lists, once regularly circulated to bookstores on packs of microfiche, went digital in the late 1980s along with others in the book trade – an unheralded benchmark

at D. E. Shaw. "I did tell him that we might be competing with him, too," Shaw says. Bezos was willing to accept that risk.

When MacKenzie and Jeff Bezos made their now semifamous cross-country road trip to the Seattle area, Jeff tapping out a business plan on his computer along the way, he had already spent months laying the groundwork for Amazon.com, beginning with his Internet investigations at D. E. Shaw. Bezos had also made at least one recruiting trip to California to meet with three programmers he'd learned about through a D. E. Shaw partner. Over blueberry pancakes at the Sash Mill Cafe in Santa Cruz, Bezos managed to convince one of them, Shel Kaphan, to become employee number one.

Kaphan has a reputation among the engineering staff at Amazon.com as the prototypical pessimist, a geek convinced that the company's systems are always on the verge of implosion. He came by his doomsaying honestly – he had worked for at least a dozen companies before Amazon.com, including failed start-ups and bureaucratically inept monsters. Shortly before he and Bezos met he had 174 ▶

The Inner Bezos

◀ 173 left Kaleida Labs, an ill-fated Apple spin-off, which makes it all the more remarkable that he almost immediately found Bezos trustworthy – so trustworthy, in fact, that Kaphan agreed in short order to relocate to Seattle.

Bezos returned in principle to the setting of his childhood experiments, building the prototype for Amazon.com with Kaphan and a contractor named Paul Barton-Davis in the cramped, poorly insulated converted garage of a rented home in the Seattle suburb of Bellevue. A potbellied stove commanded the middle of the room, and extension cords ran everywhere because there weren't enough electrical outlets to power the trio's Sun SPARCstations. Eventually the stove was ejected in a space-saving flurry and replaced by a set of ceramic space heaters, which further taxed the over-

part of the group and became Amazon.com's first board member.

At one point, a single venture capital firm in the Seattle area wanted to take the whole million-dollar round but demanded a 50 percent discount on the valuation Bezos had offered. He refused and the VCs passed, in part because they believed Barnes & Noble would crush Amazon.com as soon as it turned its attention in Bezos's direction. Watching that decision, Alberg says, taught him that "you need to do due diligence in this world, but at some point you need to make a judgment about the people."

Bezos and Kaphan rigged the SPARCstations to sound a bell's ring every time the servers recorded a sale. Amazon.com launched in July 1995, and the bell started ringing – so often that within a few weeks the noise had become unbearable and they disabled it. "Every week, the revenues went up," says Alberg. "By the

Bezos readies for battle (at right, above) and puts himself in the line of fire at the '98 company picnic.

second or third week, there was \$6,000 or \$10,000, and by the end of early September there was \$20,000 a week. It was clear there was a trend here." It also helped that even in the earliest days sales were coming from around the country. "He could say, 'I had a sale in New Hampshire,' and we were all impressed," Alberg recalls.

It wasn't that Bezos was first out of the box with an idea for shopping, or that he had discovered some magic elixir unknown to

other merchants. But he had made a series of small, smart choices that added up.

It starts with the realization that in fact not everything should be virtual – that Amazon.com should own its own warehouses, so that it can maintain quality control over the packaging and shipping of orders, which Bezos sees as an essential opportunity to enhance the Amazon.com customer experience. This allows the company to combine orders for books from

multiple publishers – or orders that include a book, a CD, and a video – into single packages. It also gives Amazon.com employees who pack orders a chance to check for defective goods. In its music department, for example, the company will replace cracked or broken CD jewel cases. Locating in Seattle, therefore, wasn't about being near a technology hub as much as it was about being near one of Ingram's distribution facilities, which allowed for quicker turnaround on deliveries from that key supplier. And Washington had a relatively small population, which limited the pool of potential customers from whom Amazon.com would be forced to collect sales tax. (It's no accident that the company's second warehouse is in Delaware, which not only has no sales tax but is also an ideal base for serving East Coast customers; its third and latest warehouse is near Reno, Nevada – which lets Amazon.com originate deliveries close to the huge California population, but just outside that state's tax-collection borders.)

Bezos combined those pragmatic choices with a relentless focus on the customer experience: tweaking the interface to make it ever easier to understand, streamlining the ordering process at every turn, responding immediately to every customer query. "We want people to feel like they're visiting a place," he says, "rather than a software application."

He also turned hiring staff into a Socratic test. "Jeff was very, very picky," says Nicholas Lovejoy, who joined Amazon.com as its fifth employee in June 1995. In endless hiring meetings, Bezos, after interviewing the candidate himself, would grill every other interviewer, occasionally constructing elaborate charts on a whiteboard detailing the job seeker's qualifications. If he ferreted out the slightest doubt, rejection usually followed. "One of his mottos was that every time we hired someone, he or she should raise the bar for the next hire, so that the overall talent pool was always improving," Lovejoy says.

With its potential \$250 million in revenues in the fourth quarter of 1998, Amazon.com is on track for at least \$1 billion in annual sales this year. The company has moved its headquarters three times since starting in the Bellevue garage, and its staff is spread out in four buildings in downtown Seattle, in addition to its Northwest warehouse location, in an industrial area near the port facilities that stretch along the harbor south of downtown. This summer, the company will consolidate all but the warehouse



burdened power supply.

In their quest to revolutionize retailing, the threesome made ample use of the unsuspecting competition's physical resources. One can never tire of the delicious irony that Kaphan and Bezos would frequently repair to the Barnes & Noble store in downtown Bellevue to drink coffee and toss around ideas in the relative calm of the in-house Starbucks café. The superstore also served as a venue for business meetings with outsiders. MacKenzie Bezos even negotiated the company's first freight contracts there.

The first million dollars of seed capital came from a group of 15 angel investors Bezos had persuaded to help him, including Wall Street chums, friends of his parents, buddies from Princeton, and a small group of local investors. Tom Alberg, onetime president of Lin Broadcasting, a subsidiary of McCaw Cellular, was

operation in the old Pacific Medical Center building, which sits on a bluff near the intersection of I-5 and I-90 southeast of central Seattle.

But nothing about the company's physical or revenue growth can compare to the astonishing rise in its stock price in recent months – on January 19 Amazon.com's \$22.1 billion market value exceeded that of Kmart and JCPenney combined – and the concurrent growth in Bezos's personal net worth, over \$9 billion by mid-January 1999. (A few other billionaires, including his parents, and dozens of multimillionaires have been created during the two short years of Amazon.com's public existence.)

Bezos is thus far facing down stratospheric wealth with a modesty that outsiders to tech culture often find odd (and maybe even unnatural) but which is surprisingly common in the industry, where twentysomethings worth millions routinely rent along the freeway. When Joshua Weinstein teased Bezos about being listed on the Forbes 400 roster of the richest Americans, for example, "Jeff said the only real difference was that he doesn't have to look at the prices on a menu anymore."

"One thing to keep in mind," Bezos says, about not only his own gains but those of any Amazon.com employee who holds unvested options or hasn't sold their stock, "is for many of these people the wealth that they have is paper wealth, and it will exist at that level only for as long as we continue to serve our customers well." Securities and Exchange Commission records show that Bezos himself has profited directly from his Amazon.com stock only once, when, last November, he sold 180,000 shares (of the more than 19 million he held at the time) for approximately \$23 million.

Like a lot of other newly minted tech barons, Bezos's splurges tend to involve having a good time with friends. In August, to celebrate Shel Kaphan's fourth anniversary at Amazon.com, Bezos organized "the Shelebration," a four-day surprise weekend excursion to Maui. He chartered a jet to carry himself and MacKenzie, Kaphan, and members of the Amazon.com engineering staff and their spouses from Seattle to Hawaii. When the group arrived at the house Bezos had rented, Kaphan discovered a second surprise: An even larger group of Shel's old friends from the San Francisco Bay Area had arrived there first, aboard a second plane Bezos had chartered for them from San Jose.

MacKenzie and Jeff, who've lived till now in a one-bedroom rental in downtown Seattle,

also recently went shopping for a house, spending a reported \$10 million for a rustic mansion alongside Lake Washington in a neighborhood littered with Microsoft millionaires.

It's often forgotten how recently the mass American consumer market has evolved, how profoundly it has changed the way people shop, and how dramatically it has altered the very structure of society. Little more than 100 years ago, most Americans bought their goods – including clothes, food, furniture, even at times books – directly from the people who created them. But as the Industrial Revolution penetrated industry after industry, a gap began to open between producers and consumers until the one had little or no direct contact with the other. A new breed of middlemen arose to act as brokers between them (creating legendary opportunities for what sociologist Thorstein Veblen, in his *Theory of the Leisure Class*, derided as "conspicuous consumption"). In turn, routine, public display of manufactured, store-bought wares enabled the development of virtual societies (or "consumption communities," as historian Daniel Boorstin labeled them) in which membership and status were based not on an inborn class hierarchy but on the ownership of specific types of goods.

The most successful of the new retailing middlemen were the salesmen and magnates who understood that Americans, particularly in the rapidly urbanizing society of the late 19th and early 20th centuries, wanted their status anxieties satisfied by the shopping

anywhere in the world, and charge accounts. Wanamaker's landmark Philadelphia store still operates at the corner of Broad and Market streets, and his New York store at Broadway and Astor Place was that city's premier shopping destination from the 1890s until the 1920s, when it was finally surpassed by Macy's, "The World's Largest Store."

But perhaps the most significant innovation by Wanamaker and his peers – who included Marshall Field, Boston's Filene family, and Isidor Straus, who ran Macy's – was their decision to display their mass-produced goods artfully behind plate glass, which new technologies had made easier to produce in ever larger sheets.

Before 1885, most merchants, if they chose to display anything, simply piled goods haphazardly in their front windows. It took an impresario named L. Frank Baum – who later indulged another kind of American fairy tale when he wrote *The Wizard of Oz* – to change that. In 1897 Baum began publishing a trade journal called *The Show Window* and a year later founded the National Association of Window Trimmers.

The goal of any good store-display designer, according to Baum, was to "arouse in the observer the cupidity and longing to possess the goods." Under his example, department store merchants began to use glass, light, and color to create street-corner crowds and stimulate their audiences in ways previously unknown. "What a stinging, quivering zest they display," novelist Theodore Dreiser said in 1902 about the newfangled "show windows" he had encountered, "stirring up in onlookers

Bezos has profited directly from his Amazon.com stock only once, selling 180,000 shares last November for \$23 million.

experience, and who built the modern department store for this express purpose. Among the most flamboyant was John Wanamaker, who sounds like a latter-day Internet entrepreneur with his boast 89 years ago that he had "revolutionized the retail business in America." Among the innovations Wanamaker could claim credit for developing or popularizing were escalators, the glass display cabinet, the street-level store entrance, the revolving door, free delivery

a desire to secure but a part of what they see, the taste of a vibrating presence, and the pictures that it makes."

A century later, the "show window" is alive and well, now transferred to the modern video display, whether it's connected to the Internet or receiving a television signal. Bezos and crew have focused as intently on trimming their video windows as Baum and Wanamaker concentrated on theirs.

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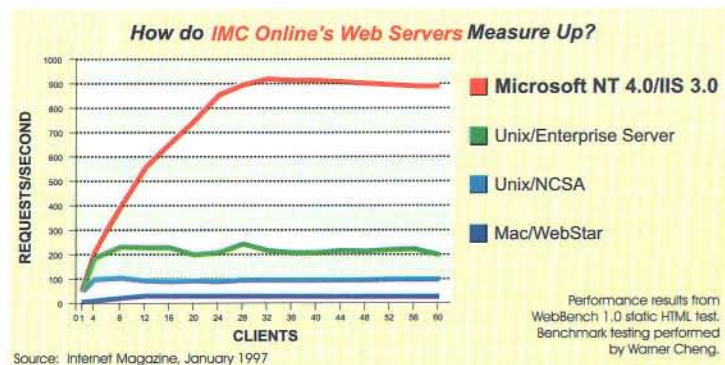
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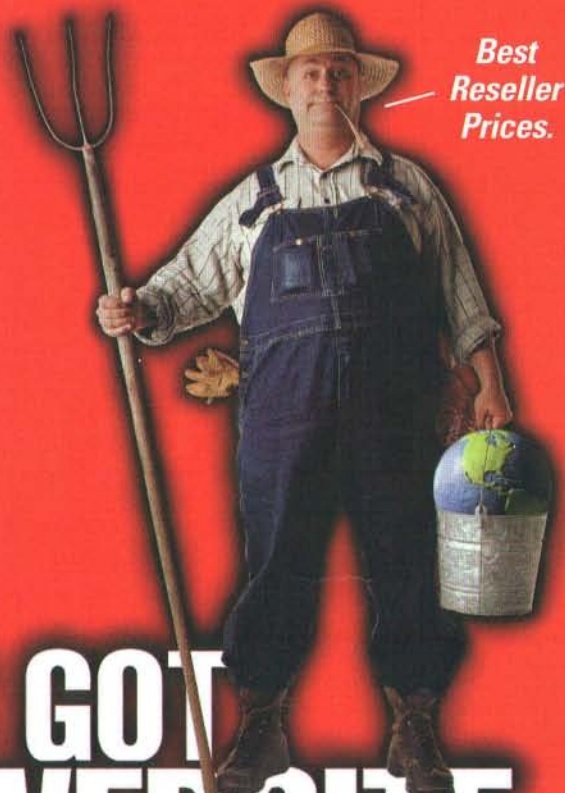
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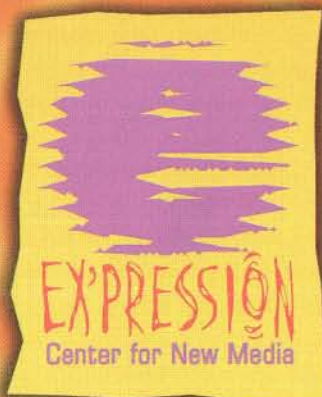
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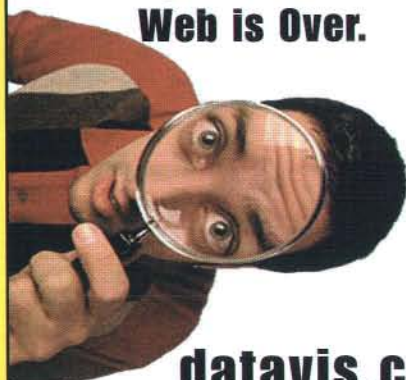
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The Inner Bezos

◀ 175 Certainly, his backers insist, Amazon.com's founder has the necessary talents. Board member Patty Stonesifer, a former Microsoft executive, points to last year's annual meeting of Amazon.com shareholders, at the Seattle Art Museum, where Bezos held the audience spellbound in a way that reminded her of the best Hollywood executives she has met. "I don't think he's a showman," says Stonesifer, "but people are drawn to him because he seems unbelievably like a winner. And they want to help him win."

Translating that ability from the annual meeting to the screen is, of course, another matter. Up to this point, the focus has been on minimizing flash in favor of speed, and on accepting the limitations of what it's possible to do within the 640 x 480 pixels available inside a browser window on a computer screen. "Every business has to deal with some scarcity, and in our case it's screen real estate," Bezos observes.

"You know, the potential exists in a broadband world for every author to have a five-minute video snippet explaining the intended audience."

But even amid the tiny graphics and fast-loading pages, the entertainment value built intentionally into Amazon.com shows through. Rankings, for example – updated in real time for the company's best-sellers – tell shoppers exactly how well each book is selling. (It's not unheard-of for authors to purchase copies of their own books just so they can see the ticker bump up.) And dedicated collectors of rarities – the most notoriously exacting crowd around, with significant cultural trickle-down – can readily appreciate Amazon.com's attention to detail. Using the music keyword-search function, for example, you can pull up a listing of the six CDs offered by Amazon.com that feature the oud, the traditional Middle Eastern stringed instrument. (*Oud* by George Mgrdichian was number 14 on Amazon.com's Middle East music chart in early January.)

As bandwidth and speed increase, making it ever easier for consumers to browse through goods online, Bezos expects e-catalogs to finally drive their paper counterparts into extinction.

The bulletin-board discussions and review areas on Amazon.com will also grow more sophisticated, he promises. "You know, the potential exists in a broadband world for every author to have a five-minute video snippet explaining who the intended audience is, why they should buy that book, or that music CD, or that video, and you'll be able to show the trailers from the videos." (Asked, however, to name the one missing technology that, if it existed, would dramatically improve Amazon.com's business prospects, he says simply, "Windows instant on" – meaning a personal computer that boots up as quickly as a TV or a PalmPilot. "At home it's a real pain," he says, "because in the 90 seconds or two minutes that it takes, I've forgotten what I was going to do!")

Bezos spends hours at a time thinking about the future: trawling for ideas, exploring his own site, sometimes just surfing the Web, particularly on Mondays and Thursdays, which he tries to keep unscheduled. "I catch up on email, I wander around and talk to people, or I set up my own meetings – ones that are not part of

the regular calendar." His surfing isn't always confined to retail: Let the record note that on a Thursday in January he spent five hours on the Web using MacKenzie's MSN account, plumbing the depths of his space fascination and learning more about "roton" rockets.

He also gathers new ideas from other wanderers in the company. Amazon.com's purchase last August of Junglee, then a Silicon Valley-based company that produces product comparison software for Web shoppers, came about when Amazon.com treasurer Randy Tinsley approached Bezos sometime in late April 1998 and lobbied for the acquisition. After a half-hour debate during which Tinsley allowed that Junglee might resist a sale, Bezos's final word was, "We have a million other things to do – drop it." Two hours later, Tinsley called Bezos back to say he had called Junglee anyway and the management there was actually interested. "It shows you how much people listen to me!" Bezos jokes.

Like an investor checking his portfolio, every

three months Bezos sits down with his assistant Kim Christenson to examine and analyze his calendar for the quarter just past. He wants to know, among other things, how much time he has devoted to each of the dozen or so categories to which Christenson has assigned every meeting, phone call, or trip. (The categories include standards like recruiting, as well as one-time items like the launch plans for Amazon.com's UK and German sites.)

Although he won't disclose all the projects currently occupying those 12 categories, one that surely colors all of them is the need to fend off the renewed challenge by Barnes & Noble to Amazon.com's book business – in particular, the potential threat to his supply chain in Barnes & Noble's recent purchase of Ingram, the book distributor that has been an essential source of Amazon.com inventory. Asked whether B&N's bid for Ingram took him by surprise, Bezos implies that he knew Ingram was for sale and passed on it, adding, "We don't talk about what we might have looked at and not done." Given that getting items into customers' hands as quickly as possible is a key part of the Amazon.com experience, he admits that distributors are also key, at least currently. But he insists they aren't a necessity long term. "There are so many ways to solve that problem," he says, one of which appears to lie in Amazon.com initiatives to build direct relationships with publishers. As for Barnes & Noble, "I bet you a year from now they will not consider us direct competitors," Bezos predicts. "Clearly they do today, but we're on different paths ... we're trying to invent the future of e-commerce, and they're just defending their turf."

Jeff Bezos is shopping in meatspace. "I want to get a pair of cargo pants," he says, "although my wife says she hates them."

We're striding up Pine Street toward the new Nordstrom store in Seattle's downtown shopping district, next door to the Pacific Place mall and only a couple of blocks from Amazon.com headquarters. Bezos wants cargo pants, he says, because he has too much stuff to carry in his pockets. Today he's packing a gizmo he calls his World Trade Center Escape Kit, a combination flashlight, penknife, and key chain that he began to carry after the New York landmark was bombed. (For Christmas, he bought every member of his

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Colophon

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The Inner Bezos

◀ 186 family their own survival kit, an off-the-shelf postmodern version of the Swiss Army knife, from Brookstone, called the Tool Logic Tool Lite Deluxe. Bezos, who has given the matter a good deal of thought, insists that the people trapped for hours in the smoky darkness of the World Trade Center's fire escapes would have reached safety faster if they had had these simple tools.) Toy shopping, online and off, captivates him. Jeff and MacKenzie's Christmas gift to everyone a year ago was laser-tag guns and vests, which, combined with the walkie-talkies his parents offered up, served as weapons in a nighttime game of laser-enhanced Capture the Flag on Amelia Island. The entire Bezos clan raced around in the dark zapping each other. "I never realized my mom was such a good shot!" he says. But Jeff, as his mother recounts with a hint of disapproval, used a secret weapon to stack the deck in his favor: a pair of night-vision goggles MacKenzie had given him. "It's not clear," Bezos counters, "that you're supposed to have a level playing field when you're marching into battle. Ah-ha-ha-ha-ha-ha!"

In Nordstrom we pick up lattes and stand in the middle of the main floor. Bezos comments idly on the down escalator: "Look, you turn immediately and go down, instead of walking from one end to the other and circulating through the merchandise." He pauses to consider whether the utility in facilitating quick passage from the main floor to the basement would outweigh the retail imperative.

For the kind of shopper Bezos represents, utility is, of course, a mantra. His wardrobe consists of white or blue dress shirts and a pair of khaki pants. Back in the late '80s in New York, when he had to wear a suit every day to the office, he gained a preference for shirts with hidden snaps under the collar points for easy tie removal. He has trouble locating this style in the Pacific Northwest, so now he buys a pack of standard snapless shirts and has the snaps sewn on. When he discovers a pair of shoes he likes, he'll buy four pairs at once and wear them in regular rotation for years.

Bezos has a full-steam-ahead, leaning-into-the-wind style of walking when he's in a hurry, and in the Pacific Place mall he is continually veering off on some new quest for knowledge. He marches into an upscale pen shop and asks the first salesperson we encounter to show us

the most expensive model in stock, which turns out to be a \$975 Mont Blanc fountain pen. "That was a very good salesman," he announces when we leave, pleased with the young man's knowledge of nib and ink arcana. As we pass Victoria's Secret he says slyly, "You know, they charge you for the catalog in the stores," and whisks me through racks of bras and panties to a cash register in the back, where he asks the clerk to show him the goods. It turns out two catalogs are for sale, one for \$5 and another for \$3. "It's the rare store that gets to charge for the catalog," he notes admiringly.

We bomb out of the mall and across the street to Old Navy. ("You know, they treat jaywalking as seriously here as they do in Los Angeles," Bezos says before leaping bravely into mid-block traffic.) Once inside, he tries on a pair of light khaki cargos, size 33R. He deliberates. He decides to buy the pants. "I'm only going to buy one pair," he says, "because my wife hasn't seen them yet."

Back out in the street, the shopping throng envelopes us. Bezos waves an arm across the scene. "You see, none of this is going away," he says. "The Net can't replace this experience."

Not that it matters. Back in his office, he's once again enumerating Amazon.com's unlimited upside and its not insignificant advantages over the places we've just been – small, centralized inventory, low-cost warehouse space, one-to-one knowledge of consumer preferences. "There's no comparison between the two models," he says gleefully, leaning forward and clasping his hands. "Online is so much cheaper."

It remains to be seen what the long-term costs for Amazon.com will be. In business, of course, the conventional wisdom is that being an innovator costs a lot more than being an imitator, a fact Bezos acknowledges. But the pioneering quality of his business model is as much an aspect of his personality as the personality of Amazon.com. "You cannot," he says, "make a business case that you should be who you're not."

"One of the things that I hope will distinguish Amazon.com is that we continue to be a company that defies easy analogy," he goes on. "This requires a lot of innovation, and innovation requires a lot of random walk" – that is, spontaneous, open-ended search.

"There's a strong case to be made for being a copier. It's just not as satisfying, or as fun!" Rule number one on how to succeed in business, from the new master of the game. ■ ■ ■

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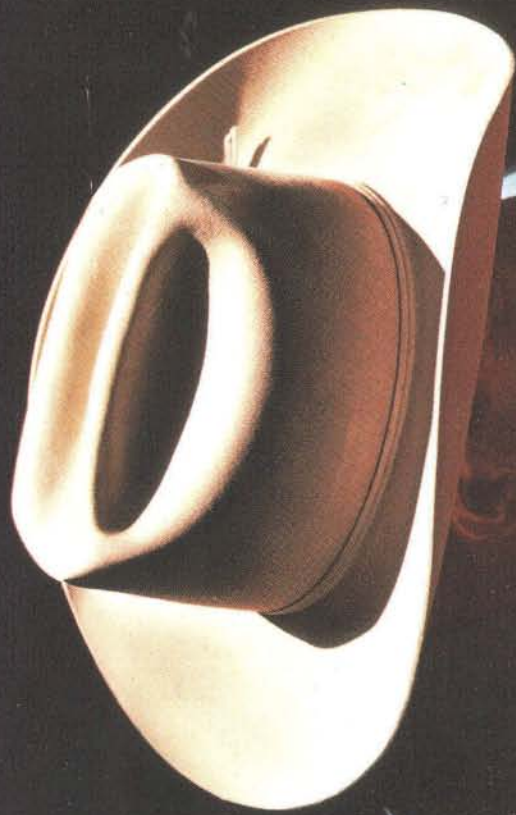
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